The Relationship Between Student Use of Socially Interactive Technology and Engagement and Involvement in the Undergraduate Experience

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THE RELATIONSHIP BETWEEN STUDENT USE OF SOCIALLY INTERACTIVE TECHNOLOGY AND ENGAGEMENT AND INVOLVEMENT IN THE UNDERGRADUATE EXPERIENCE

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Abstract

Traditional aged college students currently enrolled at institutions of higher education have never known a time without technology and through social media, can interact and engage with one another regardless of physical space. Technology provides fast, easy, efficient, and constant means of communication, and students use social media while simultaneously engaging in campus activities.

The purpose of this study was to examine the relationship between student use of socially interactive technology (SIT) and engagement and involvement in the undergraduate experience. Social media included in this study refers to cell phones, text messaging, Instant Messaging, email, and social networking sites (SNS). Borrowing items from the Net Generation Survey and the National Study for Student Engagement (NSSE) an instrument was created to analyze time dedicated to technology, use by demographics, technology as a predictor student of engagement, as well as qualitative data.

Results from 154 participants show that students use technology for approximately eight hours per day, male students in the sample are overrepresented at the lowest levels of social media use, and social media types are correlated with one another. Following a factor analysis on the independent technology items and the dependent engagement items, regression analyses were employed to explore this relationship. Qualitative data illustrate that technology use can distract students from academic activities, and limits interpersonal communication. Conversely, it is beneficial in that students are constantly updated on class discussions, campus events, and with peers and family.

Given these findings, because of students' frequent use of technology while engaged or involved in campus activities, concerns regarding the quality of these experiences are discussed. Additionally, redefining the traditional meaning of campus involvement is appropriate.

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Before beginning, there are several important people who have helped me see this project to completion. First, I would like to recognize my committee members for hours of reading, suggestions, and support. Dr. Arnold once said in class that a dissertation chairperson should be someone who genuinely cares for you - which throughout this process she has exhibited. After numerous drafts and discussion, this product's quality reflects her feedback and support. Also, Dr. Alec Peck graciously agreed to meet with me to discuss my project in the Fall of 2008. I walked into his office, and within minutes, he agreed to be a reader and provide his expertise on the topic. In addition, Dr. Kelli Armstrong, who over an invitation to a Thai food lunch casually suggested the notion of engagement, and how the study could be done on the given population. And while not a member of my committee, I thank Apryl Holder for her patient hours sitting with me in my office reviewing SPSS outputs.

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I thank my parents and family for instilling the values of education and perseverance. I truly understand how involving the doctoral process is, and the need to balance life's roles with one another. And 'thank you' to my in-laws as well, for their constant interest in my work and support over the past several years.

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Perhaps "miles to go before I sleep" aptly encapsulates the last few years. Many life events have transpired since my decision to enroll in the Boston College doctoral program. I got married, changed jobs, bought a house, became a Dean, sustained and overcame injury and illness, mourned the loss of family members, assisted my wife through job changes, chaired a national student affairs conference (ASCA), raised a puppy, and most profoundly - became known as 'Dad'. While the completion date of this project may seem overdue, life events have not kept me from attaining the rank of Ph.D, nor has the Ph.D kept me from life, nor will anything keep me from life that awaits me along my path. I look forward to many more profound and personally rewarding journeys now that this chapter has come to a close, and I relish the start of the next.

For Jennifer

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Chapter One: Introduction

The purpose of this chapter is to provide readers with an overview of the study of the relationship between college student use of technology, and student engagement during the undergraduate experience. This section includes an overview of the study including a statement of the problem, significance of the study, proposed research design, limitations, definitions of key terms, and overall organization of this study.

Statement of the Problem

Most traditional age college students currently enrolled at American institutions of higher education have never known a life without computers or electronic technology. The 'Millennial' or 'Net' Generation, were born after 1980 following the introduction of the Personal Computer (Oblinger, 2003). On today's college campus, technology has proliferated into the fabric of our institutions, and within the lives of students. As stated by Nelson Laird and Kuh (2005) "E-mail, the World Wide Web (WWW), and word processing are no longer flashy new tools used by a select few. Rather they are as commonplace as telephones and backpacks" (p. 211). In addition, the growth and popularity of technology has been quite recent, and is already having an impact on those in higher education communities. Haythronthwaite and Wellman (2002) note "In considering the integration of the Internet into our daily lives, we need to remember that the Internet is a new social phenomenon, its current version in place now only since the 1990s. Even in this short period, Internet experience and time online changes behavior" (p. 31). As time goes on, and as time spent online increases, the amount of connectivity to others will increase as the number of people that have access to the Internet increases. At various levels of institutions, faculty, staff, and students use technology in their daily

lives in a way that was previously non-existent. For example, students and faculty are using instant messaging programs to chat online on a real-time basis (Martin, 2006). Indeed, Gumport and Chun (2005) contend, "The influence of technology on the everyday life of higher education can hardly be overestimated" (p. 393). Thus, because this is a relatively new area of study, the impact of technology on institutions of higher education and college students may prove to be profound.

Several studies demonstrate the popularity of technology use by today's college students. First, Junco and Mastrodicasa (2007) surveyed over 7700 students at seven institutions and over 75% of respondents in the study reported using some type of instant messaging program (or IM). AOL Instant Messenger was the most popular, followed by MSN Messenger, and Yahoo! Messenger. The authors state that 15% of the students in the study were logged on to an IM system, 24 hours per day, 7 days a week. Interestingly, nearly 80% of the sample users sent IM messages to people who were in the same physical location, such as a residence hall room or apartment. Further, of the IM users in the study, nearly 92% responded that they were doing something else on the computer while they were logged into their IM account. Second, social network sites (SNSs) such as Friendster, CyWorld, and MySpace allow students to present personal profiles, join social networks, and establish and maintain connections with one another. They also allow users to join virtual groups based on common interests, classes, hobbies, interests, and seek romantic relationships through their profiles (Ellison, Steinfield, & Lampe, 2007). To demonstrate the popularity of such a website, in 2007, three years after its creation, Facebook was reported to have more than 21 million members generating 1.6 billion page views per day. In addition, by 2006, it was used at over 2000

American colleges and universities and was reported to be the seventh most commonly viewed site on the World Wide Web (Ellison, et al. 2007). Finally, data from the Pew Internet and American Life Project (Jones, 2002) suggest that college students today have grown up with computers as part of their daily routine: 20% of participants reported using computers between the ages of 5 and 8, and all students reported having used a computer between the ages of 16 and 18. In terms of communication, 72% of participants reported checking e-mail at least once a day, with 42% saying that they use the Internet primarily to communicate socially (Jones, 2002). Thus, it appears that the explosion of technology use on campus is relatively new, but has been readily adapted and frequently used by students.

While a portion of the literature on college students and technology centers on pedagogical adoptions in the classroom (i.e. Trees & Jackson, 2007), my particular focus for this dissertation will be on students using socially interactive technologies (SITs) to communicate with one another (Bryant, Sander-Jackson, & Smallwood, 2006). While technology in the classroom from a pedagogical perspective is an interesting realm of literature and research, my rationale for excluding this is to refine my research question to focus on the out-of-classroom experience. As Astin (1993) suggests "the student's peer group is the single most potent source of influence on growth and development during the undergraduate years" (p. 398). Now that students are interacting and communicating with one another through modern media, it will be important to better understand if and how technology plays a role in peer-to-peer relationships.

Technology media that are 'socially interactive' include those that allow students to communicate and connect with one another inexpensively, easily, and quickly.

Examples include Instant Messaging (IM), cellular phones, e-mail, social networking websites, and text messages (Bryant, Sander-Jackson, & Smallwood, 2006). College student use of media has increased over the past two decades, as students report more frequent use of these applications on campus often on a daily, if not hourly basis (Junco & Mastrodicasa, 2007). Socially interactive technologies (SITs) offer fast paced, inexpensive communication that allows users to expand personal social networks, and are redefining social networks in that relationships develop online and via a technologically-based media. As Bryant et al. (2006) report, the research to date on SITs suggests that adolescents are using this technology to enhance communication with friends and family and maintain social contact outside of daily face-to-face communication. Also, technologies such as instant messaging programs and text messaging have been adopted by students because they are easy, inexpensive, readily available, and faster than traditional technologies. Finally, although the use and preference of SITs in communication is on the rise, youth still have important conversations offline (Bryant et al., 2006).

With the new communication media in the daily lives of students, it will be important to know how they will impact student involvement during the undergraduate years. Astin (1984) defines his theory of student involvement as the amount of physical and psychological energy that a student devotes to the academic experience. He writes that an involved student "is one who, for example, devotes considerable energy to studying, spends much time on campus, participates actively in student organizations, and interacts frequently with faculty members and other students" (p. 518). Conversely, a student who is not involved spends little time on campus, does not participate in student

organizations, and does not interact with others in the campus community. The theory is based on five postulates. First, involvement refers to the investment of both psychological and physical energy into various objects and activities. Second, involvement follows along a continuum, in that different students will invest differing amounts of time and energy into their college experience, and at differing times. Third, involvement has both quantitative and qualitative features. This is to say that involvement can be measured in terms of the number of hours invested into a program or activity (i.e. a student organization) or by discussing the level of comprehension over a particular subject matter. Fourth, the amount of student learning and personal development is directly proportional to the quality and quantity of involvement in a particular activity. In essence, more 'time on task', allows for more opportunity for learning. Finally, the effectiveness of any institutional policy or practice is directly related to the capacity for student involvement. Thus, institutions that create policies and practices for student involvement offer more effective programs to facilitate student development and learning (Astin, 1984).

Similar to the notion of involvement, is the concept of student engagement. Kuh (2003) understands this construct to be "the time and energy students devote to educationally sound activities inside and outside of the classroom, and the policies and practices that institutions use to induce students to take part in these activities" (p. 25). This definition is similar to Astin's (1993) notion of involvement because each construct centers on and refers to the quantity and quality of students' participation in activities both inside and outside of the classroom, as well as the institution's ability to facilitate this participation. As Kuh (2003) writes, being engaged in the college experience adds to

a foundation of skills that are essential for a productive and satisfying life long after the college years. He states "students who are involved in educationally productive activities in college are developing habits of the mind and heart that enlarge their capacity for continuous learning and personal development" (p. 25).

Pike (2006) writes that these similar concepts are often used interchangeably within the literature on student involvement theory and student engagement. Specifically, Pike (2006) contends that historically "the writers used different terminology (e.g., quality of effort, involvement, and engagement) to describe their concepts, their views were based on the deceptively simple premise that students learn from what they do" (p. 553). Similarly, in Astin's (1984) discussion of student involvement theory, Astin himself reports that the term 'involvement' is an active term, and also lists a series of words and phrases that capture the intended meaning of this construct. Among those listed include commit oneself to, devote oneself to, join in, participate in, and *engage* in. From these statements it would appear as though the constructs of *involvement* and *engagement* are similar. For the purposes of this study, Astin's (1984) theory of involvement will serve as the theoretical lens for my research question, and engagement (the name associated with the instrument used to measure this construct) will be the studied dependant variable.

With this understanding of involvement and engagement, it is important to note that current research and literature suggest that the use of technology impacts the undergraduate experience. Several authors note concern. For example, Gemmill and Peterson (2006) investigated student use of technology and implications for higher education professionals. Students in their study reported experiencing disruptions

stemming from technology causing a delay in completing assignments and interrupting while studying. The greatest disruptions encountered in the study were from instant messages (26%), e-mail (14%), and cellular and regular phone calls (13.5%). In addition, Haythronthwaite and Wellman (2002) state that adding Internet-based activities requires users to redistribute time as a resource. They state that when time exceeds more than 5 hours per week, significant changes occur in day to day activities. In essence, time is 'stolen' from local face-to-face exchanges, from time spent talking on the phone, or time participating in local events. The authors suggest that time spent on technology may compromise local relationships, which in turn may compromise individual well-being.

Literature also suggests that technology positively enhances engagement in the undergraduate experience. For example, "surfin' with a purpose," as it is labeled in Nelson Laird's (2004) study, demonstrates that educational uses of technology such as e-mail can increase communication and promote collaboration among students and faculty members. Thus, Nelson Laird's (2004) study suggests that technology may facilitate more frequent and in-depth communication regarding academic studies. Further, writing from a faculty perspective, Martin (2006) states that she consistently 'chats' with students online. Her perspective is that not only do students communicate with her via IM, they are more likely to speak with her in person because communication and a relationship began online. Thus, if positive student engagement is related to interactions with faculty members, it appears that technology can assist in facilitating meaningful student-faculty relationships. Studies that show positive and negative impacts of technology on students today all demonstrate that technology plays a role in the daily lives of students, and may impact their use of time in college.

Regardless of perspective, authors have noted that more research in student use of technology is warranted. For example, boyd (sic) and Ellison (2007) state that the research on social network sites (SNS) represents a vast and uncharted topic still to be explored (i.e. Facebook, Myspace, Friendster, discussed below). "Methodologically, SNS researchers' ability to make causal claims is limited by a lack of experimental or longitudinal studies…scholars still have a limited understanding of who is and who is not using these sites, why, and for what purposes…" (p. 15). As college students' use of these particular interactive Internet sites is included in this study, this study can assist in filling the void in this larger body of research. In addition, Bryant et al. (2006) state that a better understanding of the relationship between technology and today's youth will lead to a more constructive means of enhancing their lives. Finally, Nelson Laird and Kuh (2005) suggest that while a relationship between use of technology and engagement exists, further study should be conducted to better understand the direction and strength of this relationship. More specifically, how does the frequent and heavy use of technology impact the college experience?

The studies noted in this section suggest a relationship between student use of technology and the undergraduate experience, and further suggest that additional research in this area be conducted to better understand the nature, strength, and depth of this relationship. In light of these studies, (as well as others discussed in Chapter Two of this study) it will be illustrated that this phenomenon is relatively recent to higher education, and that while it is impacting American college students, it is relatively unclear as to how, and to what degree. Thus, further research is needed to understand how student use of technology impacts the college experience (Nelson Laird & Kuh, 2005).

Research Question

Based on the discussion in the section noted above, the research question for this study is: what is the relationship of college student use of technology, and their involvement in the undergraduate experience? Put simply, I would like to better understand if the 'new' technology media, accessible and frequently used by college students today, is impacting the quality of their college experience, and to what degree. To clarify, because the focus of this study is on 'socially' interactive technologies (as opposed to 'academic' technologies), I will focus on how they impact a student's non-academic involvement in college.

Significance of the Study

This study has relevance and significance within the field of Higher Education for several reasons. First, as noted above, technology and the proliferation of the Internet into the daily lives of Americans is a relatively new phenomenon (Haythronthwaite & Wellman, 2002). Thus, because students attending colleges and universities today have access to socially interactive technology, they are different from students in previous generations and cohorts who did not have access to these media. Students today can communicate with a wider breadth of other individuals because of the proliferation of technology. Second, research suggests that student involvement in the campus experience is correlated with numerous positive outcomes and attributes (Astin, 1993). In addition, as Astin (1993) suggests "the student's peer group is the single most potent source of influence on growth and development during the undergraduate years" (p. 398). Now that students are interacting and communicating with one another through modern media, it will be important to better understand if, and how technology plays a role in

peer-to-peer relationships. Third, levels of student engagement have implications for the overall quality of a college or university. As Kuh (2001) states "Those institutions that more fully engage their students in the variety of activities that contribute to valued outcomes of college can claim to be of higher quality compared with other colleges and universities where students are less engaged" (p. 1). Given this statement, it is important to better understand what role technology plays in the level of student engagement. This will allow institutions the means to deliver a quality educational experience to today's college student. Fourth, this generation of college students is unique in the sense that the social and cultural context of their college experience includes pervasive access and use of technology. Authors have for decades written about the positive aspects of involvement during the college years (i.e. Astin, 1993). However, much of this literature was composed prior to the boom in technology on campuses (Junco & Mastrodicasa, 2007). Thus, this study is also significant in the sense that technology may be redefining how and in what ways students are engaged with faculty, staff, and each other.

Research Design

Discussed in depth in Chapter Three, the research method includes a quantitative regression analysis investigating the relationship between use of technology and involvement in the college experience. Items from two existing instruments were combined into a single instrument that measures student use of technology and engagement in the undergraduate experience.

The first of these instruments is the National Study of Student Engagement (NSSE). The self-administered NSSE measures two essential components of student engagement. The first component measures educationally purposeful activities to which

students devote their time and energy, such as studying, reading and writing, interactions with both peers and faculty members, and experiences with diversity. It also measures the quality of the relationships formed with faculty, student peers, and administrators. The second component measures what institutions do to facilitate or enhance student engagement such as programs, services, organizations, and aspects of the campus environment that induce students to take part in educational activities. Ultimately, NSSE annually calculates scores on several important clusters of educational practices or benchmarks. These include (among others) active and collaborative learning, student-faculty interaction, enriching educational experiences, and supportive campus environment (Kuh, 2005).

The second instrument is the Net Generation Survey, which was used in the major Pew-Funded study: *Connecting to the Net Generation: What Higher Education Professionals Need to Know About Today's Students* (Junco & Mastrodicasa, 2007). This self-administered survey measures student use of several socially interactive technologies. Items include the frequency and duration of use of media such as cell phones and text messaging, e-mail, Instant Message, and online social networking sites such as Facebook or MySpace.

Through a combination of both of these instruments, a unique survey entitled the Net Generation and Engagement Survey was administered. After completing a pilot test study of this instrument, the final version of the instrument was given to a sample of juniors and seniors at the host institution (see Chapter Three for sample rationale). Following data collection, a factor analysis and regression analysis revealed the direction and strength of the relationship between these two constructs. In addition, descriptive

statistics demonstrate how participants varied in terms of technology use by background and demographical identity.

Finally, the research question was posed to students in an open-ended qualitative item, and responses were coded and analyzed. These responses added depth and perspective to the statistical results, and assist in understanding how students use social technology in their own words. In addition, they provide rationale for the interpretation and discussion of overall findings.

A complete discussion of the method will be discussed in Chapter Three of this study, and results and discussion will follow in Chapters Four and Five, respectively.

Limitations of the Study

Several limitations exist within this study. First, the host institution, is a private, selective, Catholic, institution with a high cost of attendance. It is possible that students in the study come from families with financial resources to provide them with high priced technology media such as cellular phones and service, and personal computers. Students in the study may have also have had access to these items prior to enrolling as well, and thus may be predisposed to frequent use of technology when compared to students at other institutions. Second, the research site is a highly residential college where students live with other members of their academic class. Given this, students would have more opportunity to interact with each other in person, attend evening programs and events, and have easier access to faculty and staff members than would students on predominately commuter campuses. The National Study for Student Engagement instrument measures characteristics such as these when determining student engagement. Thus, if it is found that students at the host institution appear to be more engaged than

those on other campuses, this may be reflective of the culture of the university. Finally, the timing of the data collection may influence student responses to the instrument. Precautions were taken to avoid peak academic times such as midterm examinations when students may be immersed in academic responsibilities as opposed to social communication. A more in depth discussion of limitations following data collection is presented in Chapter Five.

Definition of Terms

This section is designed to provide readers with operational definitions for the key terms and concepts used throughout this study.

Engagement: As defined by Kuh (2003), engagement is the "the time and energy students devote to educationally sound activities inside and outside of the classroom, and the policies and practices that institutions use to induce students to take part in these activities" (p. 25). Stated simply, the more students spend 'time on task' (i.e. a particular activity, program, project, etc.) the more adept they become. Similar to Astin's (1984) notion of student involvement, both concepts stress the physical and psychological time and energy devoted to college life, as well as institutional practices employed to facilitate student involvement.

Facebook: Refers to a specific Social Networking Site ('SNS', defined below) that is arguably the most common among current college students (Eberhardt, 2007; Ellison, Steinfield, & Lampe, 2007; Martinez-Aleman & Wartman 2008).

Instant Messaging (IM): Refers to an interactive electronic discussion board for users to have real time communication online. Users immediately know which other individuals on their contact lists are also online. Communication begins when a user initiates an

online discussion through a chat window on a computer or Personal Digital Assistant (PDA). IMs often allow users to multitask in that a user can be working on another project, and notices are sent as new messages are received from their contacts (Farmer, 2005).

Involvement: Similar to that of engagement, involvement refers to a student's investment of psychological and physical energy into the college experience (Astin, 1984). Involvement has both quantitative and qualitative features, and the amount a student learns is directly proportional to the quality and quantity of involvement.

Millennial or Net Generation: Discussed in greater detail in the next chapter, names commonly assigned to the generation of traditional age (i.e. 18-24) students currently attending American colleges and universities.

National Study of Student Engagement (NSSE): An instrument used at colleges and universities nationwide that provides institutions with measures of student engagement (Nelson Laird & Kuh, 2005). Select items from this instrument will be included with the research instrument proposed in this study.

Net Generation Survey: Designed by Junco and Mastrodicasa (2007), this instrument seeks to measure college student use of technology in terms of breadth of media used as well as the time devoted to using them. Select items from this instrument will be included (along with those noted above with NSSE) with the research instrument proposed in this study.

Socially Interactive Technologies (SIT): refers to a series of media, including text messaging, instant messaging programs, social networking sites, etc. that are beginning to redefine communication and the social networks of today's youth. As stated by Bryant et

al. (2006), “By offering fast-paced, inexpensive, online communication, SITs allow for new online youth social networks to form and evolve” (p. 577).

Social Networking Site (SNS): A type of website that allows users create personal profiles, join social networks, and establish and maintain connections with one another. Users may use these sites to join virtual groups based on common interests, classes, hobbies, interests, and seek romantic relationships through their profiles (Ellison et al., 2007).

Organization of the Dissertation

This dissertation is presented in five chapters. This first chapter was designed to provide readers with an overview of the topic, problem statement, significance of the study, and foreseeable limitations. The second chapter, the literature review, discusses and analyzes relevant research on the topic to date, as well as provide a discussion and illustration of the two constructs being compared. The third chapter provides an overview of the methodology that was used to collect the data to demonstrate the relationship between student use of social technology and engagement. Following data collection, Chapter Four provides an analysis of the data as well as an illustration of the results. Finally, Chapter Five discusses these results and provide implications for future practice and research.

Chapter Two - Literature Review

The purpose of this chapter is to review the literature on students presently enrolled at United States institutions of higher education in terms of their use of technology, and their engagement in the college experience. In providing a conceptual framework, this section will begin with a discussion of the concept of generations, and offer a brief historical overview of generations within institutions of higher education. Following this review, I will illustrate the salient themes and characteristics of students in the current generation to provide readers with a foundation and overview of the population being studied. The focus will then be more specific on college student use of socially interactive technologies (i.e. e-mail, Internet, cell phones, websites, etc.) and how they play a role in the lives of today's student.

Following the review of student use of technology, this literature review will then illustrate the concept of student engagement and involvement. As noted above, 'engagement' is defined as "the time and energy students devote to educationally sound activities inside and outside of the classroom, and the policies and practices that institutions use to induce students to take part in these activities" (Kuh, 2003, p. 25). The concepts of student engagement and involvement in the college experience will also be discussed in terms of their relationship with socially interactive technology. Throughout this review, I will comment on my analysis of the literature as well as the various methods and rigor of the material. The literature and research presented will form the background of my dissertation study on the topic of college student technology use and its relationship and impact on student involvement and engagement.

Generations in Higher Education

When examining students attending institutions of higher education today, it is important to understand how or why they might be different than students from other time periods. To begin, the concepts of 'generations' and 'cohorts' provide a historical background, as well as a lens through which to view the literature on today's students. There are several models and approaches employed to understand the nature and definition of these concepts.

First, a human aggregate model suggests that students are attracted to, and stable in, environments where they share similar personalities or vocational preferences. Groups of students in this model are viewed by the way they gather information and make decisions, and by congruence and consistency (Coomes & DeBard, 2004). Second, in Lancaster and Stillman's (2003) *When Generations Collide*, generations are defined as consisting of people who share a common history, in which the events and conditions experienced during the formative years determine how one views the world. Both icons and conditions in historical time periods shape the attitudes, work styles, and values within a generation. Icons consist of people, places, things, or actual events that serve as reference points. For example, images of Dr. Martin Luther King, the assassination of a president, D-day or the *Challenger* Space Shuttle serve as icons for different generations (Lancaster & Stillman, 2003). Conditions include economic or political forces at work within the environment as each generation comes of age. In addition, changes in family structures such as marriage rates, divorce rates, or changes in the number of single-parent families are conditions that play a role in generational identity. Thus, each member of the generation develops a "generational personality" (p.14). Third, Howe and Strauss

(2000) advocate for a peer personality model that can be applied to defining a generation. The peer personality is based on social issues and events of the time, as well as a group of people in a similar age range moving through time with similar experiences. In addition, this model suggests that generations are defined in part by interactions and relationships with other generations (Coomes & DeBard, 2004).

In addition to generations, a study of cohorts and cohort analysis offer an additional means to view people and groups throughout time. Glenn (2005) states that a *cohort* was originally referred to a group of warriors or soldiers, but is now used more commonly in a general sense to reference a group of individuals who have a characteristic in common. In addition, the terms *birth cohort* or *age cohort* are often used in social science literature but do not capture the rule that cohorts are identified by an event which defines it (Glenn, 2005). Cohort analysis is a method to explain how cohorts differ from one another and seeks to study two or more cohorts in regard to at least one dependent variable, measured over time. In the literature on cohort analysis, the term is used in a more specific sense to refer to those individuals who experienced a particular event during a specific period of time (Glenn, 2005). A cohort approach attempts to describe generations by the salient features, attitudes, beliefs, and behaviors of students. To illustrate this, differences among people, *cohort effects* demonstrate that people of different ages are members of differing cohorts because their lives were shaped by shared formative events that were unique to their era and accompanying developmental stage. For example, as Glenn (2005) writes “persons born in the United States in 1920 spent their late adolescence and early adulthood in the Great Depression, whereas persons born just 10 years later spent the same stages of life in a period of unprecedented prosperity

and economic growth" (p. 3). The contrast between these two groups appears to have created lifelong differences between the cohorts in terms of economic and political attitudes and behavior. Thus, not only is there a notion of a defining social element, but persons identifying with a specific cohort also share a similar timeframe as well. As Levine and Cureton (1998) write, "There is a preoccupation in this country with searching out the distinctive characteristics in every new generation of young people, the ways in which the current generation seems different from the last" (p. 2). An appropriate name or title is then given to the generation that captures the traits of the cohort. In the case of the students in this study, the Millennials, or Net Generation appropriately captures these traits.

Ryder (1985) writes that new cohorts represent an opportunity for social transformation in that society counterbalances attrition with new birth cohorts (those persons born in the same time interval and aging through life together). In other words, as older population members pass away, new members of the population bring about changes in society. He writes that a society of immortal members would resemble that a stagnant pond, and that each new cohort "makes fresh contact with the contemporary social heritage and carries the impress of the encounter through life" (p. 11). Thus, because of changing times and social contexts, cohorts provide the opportunity for social change to occur. Because cohorts encounter a specific temporal period of history, each cohort is unique and differentiated from all others. "The cohort record is not merely a summation of a set of individual histories. Each cohort has a distinctive composition and character reflecting the circumstances of its unique origination and history" (Ryder, 1985, p. 12).

For the purposes of this study, the concepts of cohorts and cohort analysis are important to consider when examining the lives of today's college students. This literature suggests that because of their birth years, current ages, and unique social contexts, students enrolled in institutions today are by nature different than previous cohorts or generations. More specific to my research interests, I argue that with the advent and proliferation of technology (i.e. computers, Internet, communication media, etc.) over the past several decades, college students today exhibit unique traits and characteristics that not only impact their lives, but the institutions in which they enroll as well. To support this notion, Ryder (1985) writes that "The principal motor of contemporary social change is technological innovation. It pervades the other substructures of society and forces them into accommodation" (p. 22). Technological development and industrialization are not accomplished by a retraining of an entire society, but rather by introducing each new cohort to the modern way of life. He goes on to state that technological impact on a population is differential by age, and that it is most felt by those who are about to make their 'life long' choices of careers and vocation. Further, he states that the age of an industry tends to be correlated with the age of its workers. It follows then, that modern day American society and its technological advances find college student cohorts today incorporating technology into their daily lives, and will continue to do so in the workforce following graduation.

In addition to generations and cohorts, Giele and Elder (1998) introduce the concept of 'life course,' which serves as a lens to view individuals and their birth cohorts over time. The life course paradigm involves the interplay of four key concepts. A person's *location in time and place* refers to the general and unique cultural experience of

an individual (i.e. growing up during the Depression). *Linked lives* or social integration, is the social, cultural, and institutional interaction between persons, and how social relationships impact individuals. Human agency incorporates the motives of individuals and groups to meet their needs, and to actively make decisions and organize their lives around attaining goals. Finally, the *timing of lives* involves how persons or groups respond and adapt to the external events of their time. Life course studies have a longitudinal framework through which to study the development of individuals within their cohorts over time. While abstract, the life course concept may provide a larger framework to understand the lives and characteristics of the current generation of students.

These models suggest that socialized differences exist across generations and cohort groups. To illustrate one example, Tapscott (1998) predicts that as the Net Generation (a synonym for 'Millennial' – discussed below) arrives in the workplace, older generation members such as Baby Boomers and Generation X will have to adapt to the technology skill sets of today's graduates. In his words, "Unless the boomers throw out years of conditioning and old models of work, they will be washed away by a wave of media-savvy, confident, peer-oriented, innovative N-Geners. Call it generational displacement in the workforce" (p.234).

Specific to institutions of higher education, Geiger (2005) contends that there have been ten generations throughout educational history who have attended institutions of higher education from the founding of Harvard through the current day. Each generation can be described in terms of "…what was taught, the experience of students, and the array of institutions" (p. 38). Geiger (2005) argues that different generations

within higher education appear on average, every thirty years. In a historical context, college campuses employ members of previous generations who are older than the Millennial generation. For instance, the Baby Boom Generation was born between 1943 and 1960. Boomers have been characterized as rule-abiding, having families with stay-at-home mothers, favoring negativism over positivism and self over community. In addition, Generation X consists of those born between 1961 and 1981, and are considered reckless and uneducated, and have faced issues of drug addiction, divorce, and environmental problems (Geiger, 2005). Generation Xers are often criticized by Millennials for showing a lack of initiative and fortitude (Howe & Strauss, 2000). While each of these generations exhibit specific traits, identities, and perspectives, for the purpose of this paper, these brief descriptions are offered as a historical context in which to frame the Millennial generation.

In light of this discussion regarding generational personalities, a more focused illustration of the current generation of college students will follow.

The Current Generation

While the discussion of this topic thus far has labeled those born after 1982 as 'Millennials' (a term popularized by Howe & Strauss, 2000), there are several other works and authors that propose a different name for this phenomenon. For example, this population has also been called Generation Y, and Echo Boomers (Junco & Mastrodicasa, 2007). Several authors support the notion of calling this generation the 'Net Generation' due to the impact that technology and the Internet have had on their overall development. (i.e. Junco & Mastrodicasa, 2007). Tapscott (1998) favors using the term 'Net Generation' (or N-Generation, N-Gen, etc.) as opposed to Generation Y to

describe this cohort because this terminology encapsulates the demographics of this generation as well as the power of the contributing media. In addition, his book suggests that the term Generation Y builds too much on the term Generation X, and that a clear distinction between N-Gen and X should be made. While a specific name or title for this phenomenon is elusive within the literature, the major works contend that this generation has several unique identifying characteristics that set it apart from previous generations. Because the naming of this generation has not been universally agreed upon in the literature, this particular study will use terms such as Millennial, N-Gen, or Net Generation, or simply 'today's students' interchangeably throughout this work.

The remainder of this section is intended to illustrate and synthesize works that describe the current generation of college students and the major trends and themes which describe them. Before beginning this examination however, it is important to note several caveats regarding the study of this generation. First, the descriptions and predictions about 'Millennials' do not always capture specific individuals, but are rather based on generational models of historical and cultural data. For example, Coomes and DeBard (2004) state that 'big picture' generational descriptors may not include perspectives of marginalized students such as GLBT, students of color, or other cultural or ethnic groups. Additionally, this generation will be influenced by increased numbers of immigrants migrating to the United States (Broido, 2004). Essentially, not every person born into this cohort fits the mold. Second, as Sandfort (2001) notes, much of the research in this field is on American students who are the oldest members of this generation, and who graduated from high school around the year 2000. Thus, this generation and literature are relatively new, and may be difficult to describe in several

key terms or descriptors. Finally, many of the observations and citations in the literature come from Howe and Strauss (2000): *Millennials Rising: The Next Great Generation.* This extensive description of the generation appears to be one of the first, and most commonly cited, works on the subject. While it is used by many as a resource, it is also criticized as lacking a sufficient empirical research foundation. For example, the authors note in their work that their own families and children were interviewed while composing the book and these personal comments and perceptions were added in their study. Moreover, many of the descriptors, quotes, and examples used throughout their work were taken from popular news programs and other popular media. While these sources do have a degree of validity, they do not rise to the scholarly level of peer-reviewed journals or scientific studies. The contents of this work may also now be dated because it was published prior to September 11, 2001. As noted previously, major social, cultural, and historical events impact the nature of a cohort (Giele & Elder, 1998).

Thus, there is a concern about over-reliance on this single Howe and Strauss (2000) work. For example, although Junco and Mastrodicasa's (2007) publication presents empirical statistical data regarding technology use at seven institutions, their review of literature relies heavily on the work of Howe and Strauss (2000). More robust and scholarly work is needed in the literature to confirm the phenomena and descriptors within this generation. It is important to note that the latter sections of this paper include and discuss scientific and rigorous scholarly work detailing the lives of current students in terms of technology and engagement, but that the general descriptors included in this section are based to some extent on non-empirical research.

Demographics

Several noteworthy demographic characteristics describe this generation, and how they may impact college campuses. First, the current generation of students is the most diverse generation in American history (Marx, 2000). As Broido (2004) reports, the populations of Blacks, Asians, and Latino/as are increasing as a percentage of the overall population. Within the larger United States population, the percentage of non-Whites will increase, and over the next 50 years, ethnic and racial groups traditionally referred to as 'minorities' will be similar in number to Whites. Further, more persons under the age of 18 are self-reporting to be biracial or multiracial. It is predicted that traditional minority group members will have greater representation in political offices and play a larger role in legal and governmental processes as well (Marx, 2000). In addition to racial diversity, research also suggests that more students identify as gay, lesbian, or bisexual at younger ages, even before arriving on campus (Broido, 2004). Finally, this generation is experiencing a polarization of wealth. As reported in 2003, after tax income was more highly concentrated at the top of the scale than any other time during the 1979-2000 period (Broido, 2004). Given these characteristics (further discussed below), institutions may face student issues and concerns that were not seen in previous generations.

Characteristics, Attitudes, and Predictions

To introduce the descriptions of 'Millennials' in the literature, Marx (2000) writes "This media-shaped generation is often described as confident, sociable, optimistic, and moral, with plenty of street smarts, and accepting of diversity" (p. 37). There are several key descriptions in the literature that offer views of the characteristics, attitudes, and predictions for the future of this generation. First, this generation is competitive and

academically minded, and research suggests that Millennials view education as a catapult into professional careers (Howe & Strauss, 2000; Sandfort, 2001). In a 2001 study, an overwhelming majority of high school students stated that a college education was one of their top two priorities, and many already had a career in mind (Sandfort, 2001). Second, the literature suggests that Millennials will be focused on issues of social justice, community service, and remedying social ills that existed in previous generations. These issues include AIDS, drug usage, and school violence (Howe & Strauss, 2000). Sax (2003) reports that in 2003, 82.6% of college freshmen performed volunteer work during the year prior to enrolling in college. She goes on to state that students today feel empowered to work within their schools, religions, or other organizations to effect change on a local level. Third, students of this generation have a tendency to support 'zero tolerance' behavioral policies, and may be reversing negative behavioral trends of their predecessors. For example, Howe and Strauss (2000) state "Teen sex appears to have peaked around 1990, crime and school violence in 1993, and teen homicides in 1994" (pp.189-190). Finally, the parents of Millennials play a large role in their lives. Described as 'overprotective' by Brownstein (2000), parents are becoming more involved in the day to day lives and decision-making of students today.

Several other works in the literature echo the descriptions noted in the preceding review. For example, *Growing up Digital* (Tapscott, 1998) was written by a research team that collaborated with several hundred students and adults across several continents. The researchers conducted studies with school children using online computer conferencing, e-mail, and a shared digital work space. In essence, the study of student use of the Internet was completed using the medium itself. While this material is now

somewhat dated, several noteworthy themes and predictions are pertinent to this study. Tapscott (1998) describes the Net Generation as a cohort of children who, in 1999, were between the ages of two and twenty-two. His thesis purports that the Internet and emerging technologies have been embraced by this cohort, and because of the high numbers of persons who have access to the Internet, generalizations can be made about this group. He describes ten significant themes of the people considered "N-Gen" in detail in his book. As some of these are not mutually exclusive and have some degree of overlap, the major themes of this work will be further discussed.

First, the Net Generation can be generally labeled as fiercely independent. Tapscott (1998) believes that this independence stems from the active role of information seeking on the part of this generation and that current technology allows students to be autonomously creative, and evaluate new information via the Internet. Second, this cohort possesses a sense of emotional and intellectual openness. Students in the study noted that they were comfortable by displaying personal traits and their personalities on the Internet. As noted in one case, students might feel the need to "spill their guts" (p. 68) without backlash or repercussion because such problems are avoided due to the anonymity of the Net. Students in the N-Gen also value a sense of inclusion because the Internet stretches beyond national and global boundaries. Students are easily able to communicate with others from diverse cultures at any time of the day. Thus, many N-Geners believe that this will lead to a generation that is more tolerant of others than previous generations. In addition, the current generation of students welcomes freedom of expression for strong views. The Internet and technology have exposed students to a wealth of opinions, views, and perspectives, thus leading them to consider that access to

information and freedom of expression are fundamental rights. Another important trait of the N-Gen is the expectation of immediacy and the expectation of real-time decisions and actions. As Tapscott (1998) suggests, previous generations had to wait for services such as postal mail and library books taking weeks to arrive if requested from another library. Essentially, the children of this digital era expect fast and immediate information because in their perspectives, things in our world should and do move quickly.

Similar to other authors mentioned in this section, Junco and Mastrodicasa (2007) identify the seven dominant themes of the Net Generation. Their work suggests that students today are perceived to be special in the roles they play and will play in our society in that they are sheltered, confident, conventional in terms of sharing the values of their parents, team-oriented, highly academically achieving, and pressured to perform well (specifically in terms of academics and college admissions). These characteristics parallel some of the other major works and authors noted in this section (i.e. DeBard, 2004; Howe & Strauss, 2000), and are also shared in the Junco and Mastrodicasa (2007) study. Most notably, the study conducted by Junco and Mastrodicasa (2007) discusses and illustrates what technologies students are using, and to what frequency and degree (as discussed below). Thus, while the name of this generation varies from author to author, there is a sense of consistency by which to describe the major traits and tenets of this population.

It is important to note that research has recently been completed on the values, attitudes, and predictions of this generation, but limited research has been done on their actual actions and behaviors (Sandfort, 2001). In other words, further research may confirm or deny these descriptors. For the purposes of this study, the above traits,

themes, and characteristics provide a backdrop to better understand today's college student in moving forward toward an extended study. My particular research interest however, is college student use of socially interactive technology, and how it relates to the construct of student engagement.

Use of Technology

As introduced above, students today have not known a life without computers, and the Internet and other technologies have become woven into the fabric of the everyday lives of most American college students (Junco & Mastrodicasa, 2007; Oblinger, 2003). The purpose of this section is to illustrate the various technological devices and programs used by today's college students, as well as the prevalence and frequency of use of technology among students.

To introduce the concept that technology use is prevalent in the day to day lives of modern day students, Oblinger (2003) notes that the oldest members of this generation were born in the 1980s, following the introduction of the personal computer. Twenty percent reported initially using computers between the ages of five and eight; and at the time of the study, 84% of college and university students reported owning a computer. Among teenager in Oblinger's (2003) study, 70% used Instant Message (IM) as a means of communication, 81% used e-mail to stay in touch with friends and family, and 56% favored using the Internet over using a telephone. While this is just one study and one example, the remainder of this section will further discuss the prevalent use of technology. More specifically, it will focus on computers, the Internet, various online communication programs, and the use of cellular phones.

Specific to education, Marx (2000) suggests that technology usage by Millennials will further their academic prowess. He argues that through use of technology, students will become more astute researchers who will be able to solve problems quickly. Students today have around-the-clock access to a wealth of information, and will use their technology resources to create and discover new knowledge. Gumport and Chun (2005) note that technology plays a role in the evolution of educational processes within higher education. For example, the physical space of the classroom is changing and more courses, assignments, and examinations are being offered via the Internet.

In a 2002 study by the Pew Internet and American Life Project (Jones, 2002), entitled *The Internet Goes to College*, college students were found to be heavier users of the Internet when compared to the larger American population. The data for this study were generated by surveys from 2,054 traditional college students (i.e. ages 18-24) participants from 27 higher education institutions. In addition, the Pew researchers collected qualitative data from 10 institutions based in the Chicago area. The data from college students were then compared to the findings from the larger American population regarding the use of the Internet from the 2001 and 2002 Pew Internet and American Life Project. Thus, the data collected and analyzed by the team of researchers are robust, and the authors claim that the sample is indeed reflective of a national population of college students.

Several important findings illustrate that college students are heavy and frequent users of computers and the Internet. First, the study found that college students today have grown up with computers as part of their daily routine because 20% of participants reported using computers between the ages of 5 and 8, with all students reporting having

used a computer between the ages of 16 and 18. Thus, computers and the Internet are a staple in the world in which they live. Second, in terms of communication, 72% of participants reported checking e-mail at least once a day, with 42% saying that they use the Internet primarily to communicate socially (nearly three-quarters of this communication is with friends). While a majority of the participants stated that they are more likely to use the phone to communicate socially, 85% of students considered the Internet to be easy and convenient for communication with friends (Jones, 2002).

Bryant et al. (2006) comment that "socially interactive technologies" (SITs), such as instant messaging and text messaging, are beginning to redefine the social networks of today's youth. "By offering fast-paced, inexpensive, online communication, SITs allow for new online youth social networks to form and evolve" (p. 577). To facilitate convenient communications with friends, many students are using instant messaging programs to socialize (Farmer, 2005). IM software can be downloaded and installed on a computer and allows the user to generate a contact list of other users who have also installed the program. When a user logs on to IM, they immediately know which other individuals on their contact lists are also online. As more people log onto the system, users are immediately updated with this status. Communication begins when a user initiates an online discussion through a chat window. IMs often allow users to multitask in that a user can be working on another project, and notices are sent as new messages are received from their contacts (Farmer, 2005). Farmer (2005) cites that 62% of Internet users between the ages of 18 to 27 have used an IM program, and that 13 million U.S. teenagers use IM. In addition, 69% of teenagers who use the Internet use IM at least several times per week. The author posits that as the popularity of this medium grows,

instant messages will compete with other forms of communication such as phones and e-mail to be a primary source of communication in everyday American life. Finally, Bryant et al. (2006) contend that this phenomena is a youth-preferential activity, with 74% of online adolescents in the U.S. having used instant message programs as opposed to 44% of online adults.

A study from the Pew Internet and American Life Project (Jones, 2002) reports that a typical IM session lasts for more than thirty minutes, includes three or more friends, and often involves friends from outside communities in the discussion. Interestingly, 37% of participants stated that they have used IM to say something that they would not normally say in person. In addition, 17% of instant messagers have asked someone out on a date, and conversely, 13% have used instant messaging to terminate a dating relationship (Lenhart, Rainie, & Lewis, 2001). Thus, instant messaging programs allow users to communicate with one another on a constant, streaming basis, and often can be used to transmit unpleasant or difficult messages.

In addition to socially interactive technologies such as the Internet and IM applications, social network sites (SNSs) such as Friendster, CyWorld, and MySpace allow students to present personal profiles, join social networks, and establish and maintain connections with one another. They also allow users to join virtual groups based on common interests, classes, hobbies, interests, and seek romantic relationships through their profiles (Ellison et al., 2007).

Perhaps the most common social network site for students today is Facebook. Eberhardt (2007) cites a study conducted by the Syracuse University Online Communities Research Team that reports 92% of student respondents use Facebook, and

also notes a 2007 Pew study estimating that more than 60% of individuals between the ages of fifteen and seventeen maintain some form of online social network accounts. Facebook.com is a social networking website that enables users to create a personal profile listing information about him or herself. This may include physical attributes, social interests, academic fields of study, political affiliations, relationship status, and contact information, to name a few. Once a profile is created, students can leave messages for one another (or in Facebook terminology, write on another person's 'wall') and link to other students through online social communities. These virtual communities, called 'groups,' can be started by one person who in turn invites others to join. Within the context of higher education, formal groups may include student organizations detailing events and showing member contact information, and informal groups may be centered on favorite television shows or fans of a particular sports team. In addition, Facebook features a 'friend' feature where students can agree to be online friends and have access to a web of online friends and relationships (Eberhardt, 2007). Once a user is connected to another user through the 'friend' feature, each user has the opportunity to view one another's friends, thus expanding the social circle (Eberhardt, 2007). In essence, websites such as Facebook (and MySpace or Friendster) facilitate online communities in which students can interact with one another via the Internet. To demonstrate its popularity, in 2007, three years after its creation, Facebook was reported to have more than 21 million members generating 1.6 billion page views per day. In addition, by 2006, it was used at over 2000 American colleges and universities and was reported to be the seventh most commonly viewed site on the World Wide Web (Ellison, et al. 2007).

A recent study, entitled *Online Social Networking on Campus: Understanding What Matters in Student Culture* (Martinez-Aleman & Wartman, 2008), is an ethnographic study that illustrates the lived experience of college students and their use of social networking. The researchers utilized qualitative interviews and observations of the participants that were framed by student responses to 2 questionnaires that were used to find emerging themes in student responses. Martinez-Aleman and Wartman (2008) then interviewed 20 undergraduate students and observed their use of Facebook accounts. From this, the researchers were able to make observations and several conclusions. First, student use of Facebook is mediated by racial, ethnic, and gender identities. Students of color in the study were aware of how race played a role in their profile construction whereas White students were generally unaware of racial or ethnic distinctions in their profiles. Women were more active users in the sense that they take and upload more photos and tend to their online presentation more so than men. Second, the term 'stalking' was explained by the participants as an innocent, voyeuristic, information gathering process. While students in the study indicated that this was not acceptable, they did agree that this behavior does occur. Third, among participants, Facebook appeared to be the social networking site of choice. As many of the participants were residential, Facebook's ability to schedule events, parties, and disseminate campus news, fit their niche community. Thus, the site serves as a quasi-student center, in that there is a central location that houses information on campus events and organizations, albeit a virtual one. Finally, Facebook was used as the primary means of online communication among students, and also served as the main directory for seeking information on other students. From a qualitative and ethnographic perspective,

this study adds depth and the lived experience of students in terms of their social networking. In their conclusion, the researchers state that in their opinion, the use of social networking will continue long after a student graduates from college into their future adult worlds of family, business, and community. In addition, the authors contend that many institutions will begin (if not already) to formally integrate social networking sites like Facebook into the academic and social activities of the larger institution.

Ellison, et al. (2007) conducted a survey of students at Michigan State University in regard to Facebook and social capital. Social capital refers to the resources that are accumulated through relationships among people. In essence, one's social capital increases by belonging to a network of relationships of mutual acquaintance and recognition. As Coleman (1988) writes, social capital can be productive and makes it possible to achieve certain ends and goals that without it may not be possible. For example, he states that a legislator in the U.S. Congress can build up resources and obligations from other legislators to pass legislation that may otherwise by stymied. Not only does a high degree of social capital benefit the individual legislator in this example, but also benefits his or her agenda in terms of increased action. In addition, Ellison, et al. (2007) state that through relationships, social capital allows for greater commitment toward a community, ease in mobilizing collective actions, increased access to employment opportunities, and is also related to a sense of psychological well-being and self esteem. In essence, social capital is not necessarily tangible, but "exists in the *relations* among persons. Just as physical capital and human capital facilitate productive activity, social capital does as well" (Coleman, 1988, p. 100-101).

In terms of the Internet, SNSs allow for weaker, online ties to be created with other users in the network. As the number of relationships increase and as the frequency of communication increases, so does the potential for the development of social capital, especially since the media allows them to be maintained cheaply and easily (Ellison et al., 2007). Although the Ellison et al. (2007) study was conducted only on one campus with 286 participants, their work demonstrates that SNSs allow students to become connected quickly and easily, and also illustrates the potential for social networks to be expanded and enhanced via an emerging technology.

Junco and Mastrodicasa (2007) discuss their extensive study of the Net Generation in their work, *Connecting to the Net Generation: What Higher Education Professionals Need to Know About Today's Students.* This book details the results of an online survey administered in 2006 to a population of students at seven institutions. While the response rate of 8.7% is low, the total number of responses was 7,705. The authors state that the low response rate may be caused by such factors as no incentives to complete the survey, students using non-institutional e-mail accounts, and a perceived lack of lengthy attention span for the students in this generation. Given the low response rate, it is possible that the data are biased toward frequent and heavy users of technology, and they may not include the full continuum of users. Despite these limitations, the survey instrument asks questions on use of cellular phones, Facebook, MySpace, blogs, and communication with parents. Thus, the study covers a variety of technology media used by students, and the results reflect current data on students and their use of technology.

Several interesting results further support the current generation's frequent use of technology. Over 75% of respondents in Junco and Mastrodicasa's (2007) study reported using some type of instant messaging program (or IM). AOL Instant Messenger was the most popular, followed by MSN Messenger, and Yahoo! Messenger. The authors state that 15% of participants were logged on to an IM system, 24 hours per day, 7 days a week. Interestingly, nearly 80% of the sample users send IM messages to people who are in the same physical location, such as a residence hall room or apartment. Further, of the IM users in the study, nearly 92% responded that they were doing something else on the computer while they were logged into their IM account. A sizeable portion of students stated that their school work was hurt 'more than sometimes' because of the interruptions associated with using an IM program. Thus, students demonstrate a high frequency of multitasking, and are frequently interrupted while working on the computer. Third, students in the Net Generation study also reported that they have embraced the Facebook phenomenon, with nearly 69% of students stating that they have profiles hosted by this site. Students in the study with Facebook accounts (n = 4461) typically logged on twice a day. Based on these data generated by the Junco and Mastrodicasa (2007) study of the Net Generation, it can be stated that the students included in their work are frequent users of computers, the Internet, and other socially interactive technology devices used on college campuses. Further, it appears new media have proliferated the lives of students attending higher education institutions.

In addition to the use of technology based in computer and Internet programs, cellular phone usage has also become established on college campuses today. Lipscomb, Totten, Cook, and Lesch (2007), surveyed 383 young adults attending college regarding

their perceptions of cellular phone use and etiquette. Data were collected from diverse geographic regions of the United States and revealed a high degree of agreement among respondents detailing both appropriate and inappropriate use of this technology. In this article, the researchers also cite several examples from the literature indicating the proliferation of cellular phones among college student demographics. For example, they cite a 2003 phone survey of over 1500 adults and teenagers where 30% of the participants reported that the cellular phone is the one invention that they hate most but cannot live without. In addition, based on marketing and business research, Americans are reportedly forgoing a traditional landline phone in favor of cell phones. In 2003, 43% of all phones in the United States were cellular, whereas on the global scale it was estimated that 55.1% of all phones world wide were cellular. Finally, it has been estimated that 80% of Americans between the ages of 18-65 own a cellular phone, and more specific to young adults, 55% of those between the ages of 13-17 do as well (Lipscomb et al. 2007).

As noted in the description of this generation earlier in this paper, students in the Net Generation study reported talking with their parents on average over one-and-a-half times per day, with the students typically initiating the calls. While the focus of this paper is not specific to student and parent relationships, the study by Junco and Mastrodicasa (2007) discussed above also inquired about the number of college students owning cellular phones. Their results suggest that 94.1% of participants own a cellular phone, and frequently use them to contact parents.

In terms of cell phone use and etiquette, the research team of Lipscomb et al. (2007) analyzed data from 10 Lykert-scale rated statements in which participants noted that there are several situations where cell phone usage is more or less appropriate than

others. For example, students in the study perceive cell phone use to be inappropriate during church or worship service, during a class, in a library and in a theatre during a movie. Students perceived it to be appropriate to use a hands-free device while driving, and to use a cell phone while on public transportation and in a supermarket. This is a noteworthy study within the larger literature insofar as it demonstrates that cellular phone technology plays a role in the day to day lives of college students, so much so that a specific set of ethical considerations for appropriate use have evolved. This study suggests that some sort of agreement exists as to how and when this use is appropriate during day to day activities.

Issues Related to Excessive Technology Use

Implications for heavy reliance on technology exist. For example, Kadison and DiGeronimo (2004) state that students who have difficulty making interpersonal or intimate connections with one another use the Internet to experiment sexually. While cyberspace may seem to be a safe environment, it may further isolate a student from his or her peers and does not give the student the opportunity to make personal connections. The authors state that personal connections and relationships are pertinent to good mental health. Coomes (2004) writes that students are using technology to communicate with one another and faculty members, which increases anonymity and decreases face-to-face communication and confrontation skills. A newspaper article reported that college roommates often do not confront one another face-to-face, and use electronic texts to vent frustrations - sometimes while in the same room - thus leading to further miscommunication (Dunnewind, 2005). The literature indicates that technology will

continue to play a role in the daily lives of students, but its impact on communication skills and interpersonal relationships will be an area for further examination.

In Healy's work, *Failure to Connect* (1998), the author issues a caveat to excessive computer use by children of the current generation. She states that according to governmental reports, adults using video display terminals (VDTs) report problems associated with vision including eyestrain, blurring, aching, and deterioration of vision to name a few. In addition, adults also report musculoskeletal complaints including strain in the back, neck, shoulders, and carpal tunnel syndrome. While these reports study adults and computer usage, Healy (1998) argues that these health problems may also pose a risk to developing children, as their biological systems are not fully developed and may be more vulnerable to damage. Furthermore, her study reports that childhood obesity is on the rise at a greater rate than that of parents, and with an emphasis on learning by using a computer, physical activity among current children has decreased. It is argued that children learn socialization and problem solving skills during spontaneous play and outdoor recreation. Thus, while computers and technology play a large role in the daily lives of our current generation of students, it does appear that there is a degree of concern over the physical and social development of students.

A third area of concern over frequent use of technology is addiction. Tapscott (1998) defines addiction as a "persistent, compulsive, and harmful use of a substance resulting in withdrawal symptoms when use is terminated. The term has been extended, sometimes semi-seriously, beyond substances" (p. 115). He states that some people may talk about being addicted to certain foods or chocolate, but when extended to children's use of the Internet, 'Net Addiction' can be very serious. Tapscott (1998) states that

parents of students should be careful if overuse of the Internet creates a disequilibrium in a child's life such as neglecting friends, falling grades, or giving up on extracurricular activities. These behaviors may be cause for concern. During his descriptive study, one student was asked to go without using the Internet for a period of 14 days and was asked to keep a journal of the experience. Interestingly, the student reported a greater self-awareness of the role the Internet played in his life, however he also reported feeling a lack of attachment and communication with friends, frustrations with not being able to have instant information and communication, and a sense of anxiety to get back online at the end of the two week period. In addition, the student realized over the period of Internet abstinence that his study skills and time spent on homework improved because of the reduced distraction of using the Internet. While this is one example of an adolescent abstaining from using the Internet, it is important to note the concern in the literature regarding dependence or addition to technology.

Gemmill and Peterson (2006) investigated student use of technology and implications for student affairs professionals. They examined the extent to which technology occupies and disrupts the time of students as well as to the degree by which these disturbances contribute a perceived level of stress. While this study does have limitations (i.e. administered at one institution) it does suggest that technology devices such as e-mail, cellular phones, and instant message programs impact the lives and work of college students. More specifically, students report using Internet to communicate with peers and family members regarding stressors in their lives. This in turn reduces the level of stress and assists with coping. However, students also reported experiencing disruptions stemming from technology causing a delay in completing schoolwork,

interrupting them while studying, and interfering with completing assignments. The greatest disruptions encountered in the study were from instant messages (26%), e-mail (14%), and cellular and regular phone calls (13.5%). The authors conclude the study by suggesting that the benefits of coping through frequent communication are perhaps outweighed by the distractions.

In addition to distractions while completing schoolwork, faculty and other academic professionals may have concerns as well. The Pew Internet and American Life Project (Jones, 2002) notes that educators and librarians are concerned about student research and study skills because of their reliance on the Internet. Participants in this study reported that they are more likely to use the Internet to find academic resources than library websites, and in qualitative observations, students used commercial search engines more frequently traditional library search methods. Plagiarism from electronic sources is a concern, and there is a concern from faculty that students frequently list URLs in bibliographic citations as opposed to traditional, more scholarly resources. Furthermore, there is a concern over student technology use in regards to academic honesty. Simply stated, the Internet and web-based data are readily available to students, and as such, cheating on academic work is more frequent (Wilson, 2004).

In reviewing this discussion of technology use by today's college students, there are several important themes and concepts of note. First, the studies and review of the literature above suggest that students in the current generation use computers and online programs, as well as cellular phones on a daily basis to communicate with peers and family members (Junco & Mastrodicasa, 2007). Second, students thus have the opportunity to interact with one another on an immediate and real time basis (Ellison, et

al. 2007). Third, while technology on campuses today has many benefits, adverse effects and drawbacks heavy reliance are present in the literature (Gemmill & Peterson 2006). Perhaps a poignant way to summarize this section on how students arriving at institutions today are using technology is through an illustration from Indiana University, which reported more than 96% of students come to campus with at least one computer, and additionally a PDA, cell phone, and gaming system. Many of these students expect to connect with the University's network within hours of arrival, if not within minutes (Crews, Brown, Bray, & Pringle, 2007).

Having highlighted pertinent literature regarding undergraduate student technology use, this literature review will switch its focus and discuss the concept of student engagement during the college experience. The relationship between these two constructs will serve as my dissertation research question.

Engagement and Involvement

The purpose of this section is to introduce and define the terms 'engagement' and 'involvement' during the college experience. The literature reviewed in this section will serve as a foundation for my research on how socially interactive technologies impact students in terms of this construct.

Kuh (2003) defines engagement as "the time and energy students devote to educationally sound activities inside and outside of the classroom, and the policies and practices that institutions use to induce students to take part in these activities" (p. 25). Stated simply, the more students study a subject the more they gain or learn, and the more they practice and receive feedback on writing, problem analysis and solving, the more adept they become. In addition, full time students who live on campus are typically more

engaged than their commuter counterparts. This is to be expected because living on campus allows students to have greater access to peers, institutional resources, and faculty members. Further, Kuh (2003) states that being engaged in the college experience allows students to learn life skills that are essential long after the college years. He states "students who are involved in educationally productive activities in college are developing habits of the mind and heart that enlarge their capacity for continuous learning and personal development" (p. 25).

Engagement builds on Astin's (1984) influential definition of 'involvement' as a student's investment of psychological and physical energy into the college experience. He postulates that involvement is a continuous concept in that students will invest differing amounts of time and energy into different programs, activities and tasks. In addition, involvement has both quantitative and qualitative features, and the amount a student learns is directly proportional to the quality and quantity of involvement. As discussed in the Introduction, these two terms have been used somewhat interchangeably throughout the literature. Both include the student's physical and psychological time and energy spent on activities and programs in the college experience, and both also stress the importance of institutions promoting programs that facilitate student learning through student involvement.

When viewed as a whole, Astin's (1993) work in *What Matters in College: Four Critical Years Revisited* suggests that a student's peer group is the single most potent source of influence on growth and development during the undergraduate years. A peer group is defined by Astin (1993) as a group of people with whom an individual identifies and seeks acceptance or approval. Viewed from a collective, peer groups are described

as any group of individuals in which members seek acceptance, identify, and affiliate with one another. When it comes to a student's affective development a "student's values, beliefs, and aspirations tend to change in the direction of the dominant values, beliefs, and aspirations of the peer group" (p. 389). Given the fact that peer-to-peer relationships have a significant impact on the college experience and student development, and given the fact that students today have greater abilities to communicate via technology advances, a further area of study will be to better understand how student use of technology relates to student engagement in the college experience.

Perhaps the most commonly cited measure of student engagement is an instrument implemented by the National Study for Student Engagement (NSSE). Since its inception in 2000, more than 900,000 students from nearly 1000 different four-year institutions have participated in the survey. The instrument is given to undergraduate students, and data are reported to participating institutions for comparison to peer institutions as well as national averages (Kuh, 2005). NSSE researches measures two essential components of student engagement. The first measures the educationally purposeful activities students where devote their time and energy such as studying, reading and writing, interactions with both peers and faculty members, and experiences with diversity. It also examines the quality of the relationships formed with faculty, student peers, and administrators. The second component explores what institutions do to facilitate or enhance student engagement such as pedagogy, programs and services, and aspects of the campus environment that induce students to take part in educational activities. Ultimately, NSSE annually calculates scores on 5 important clusters of educational practices or benchmarks. These include academic challenge, active and

collaborative learning, student-faculty interaction, enriching educational experiences, and supportive campus environment (Schroeder & Kuh, 2003). Thus, 'engagement' with the college experiences varies from student to student depending on his or her investment of time and energy, and can be measured by several differing student and institutional characteristics.

Assuming that engagement and involvement are an integral part of the undergraduate college student experience (Astin, 1993; Kuh, 2003), and given the dramatic recent rise of technology in the daily lives of college students (discussed above), it is important to understand how student use of socially interactive technologies impacts engagement and involvement in the college experience.

Technology, Engagement, and Involvement

This section will address how the concepts of student use of socially interactive technologies may interact with engagement and involvement in the college experience. While arguments have been made along a continuum of possibilities, the relationship between these two constructs varies among studies. While there appears to be limited research conducted on the relationship between these concepts in the literature reviewed to date, several works are reviewed below.

Nelson Laird and Kuh (2005) examined the data from the 2003 administration of the National Study for Student Engagement (NSSE) and noted that some technology use by college students can benefit them in terms of engagement. The results of this study suggest that students who devote most of their online time toward academic purposes are more likely to benefit from the collegiate experience than those who do not. For example, "surfin' with a purpose" as it is labeled in Nelson Laird's (2004) study shows

that educational uses of technology such as e-mail can increase communication and promote collaboration among students and faculty members. Thus, this study suggests that technology may facilitate more frequent and in-depth communication regarding academic studies.

Writing as a faculty member from small institution in Illinois, Martin (2006) suggests that faculty members can use technology (specifically, IM) to communicate and build relationships with students. She relays her own experience by stating "I find that the best way to establish trust with students is to speak their language. In our digital world, this language is called instant messaging. But that takes too long to say; it's simply IM" (p. 24). Martin (2006) states that not only do students communicate with her via IM but that she believes students are more likely to speak with her in person because communication and a relationship began online. Thus, if part of student engagement is related to interactions with faculty members, it appears that technology can assist in facilitating meaningful student-faculty relationships. While Martin's (2006) article is one faculty member's personal account, it does speak to the possibilities of greater student engagement.

While Astin's (1993) seminal work *What Matters in College: Four Critical Years Revisited* was composed prior to the proliferation of the Internet and other socially interactive technologies discussed in this document, his work does investigate the impact of television on the college experience. Watching television is a passive activity that can isolate students from one another and take time away from activities that can be more conducive to personal development and learning. Hours per week spent watching television while in college is associated with more than two-thirds of the outcomes in

Astin's (1993) study, and the pattern of effects is uniformly negative. For example, the number of hours per week is negatively associated with overall grade point average, graduating with honors, and self-reported growth in areas of academic and personal development. However, given the passive and isolating nature of watching television, an argument may be made for a study to examine that more interactive media may enhance involvement, and thus promote personal and psychological development during the undergraduate experience.

As Nelson Laird and Kuh (2005) suggest, use of technology and engagement overlap to promote positive outcomes in terms of engagement, however, an increased use of technology may be detrimental to engagement in the college experience. For example, Haythronthwaite and Wellman (2002) state that adding Internet-based activities requires users to redistribute time as a resource. They state that when time exceeds more than 5 hours per week, significant changes occur in day to day activities. In essence, time is 'stolen' from local face-to-face exchanges, from time spend talking on the phone, or time from activity in local events. The authors suggest that time spent on technology may compromise local relationships, which in turn may compromise individual well-being. In terms of academics, information technology also increases opportunities for misconduct such as cyber plagiarism, or inappropriate use of online information (Nelson Laird & Kuh, 2005).

In a study noted above, Nelson Laird (2004) also raises questions regarding the use of technology by different types of students and possible negative effects. Online activities create opportunities for students to become distracted or disengaged from the college experience. Certain technologies such as gaming systems (i.e. Nintendo or X-

box), and applications such as downloading music may have few, if any, educational benefits. Nelson Laird (2004) states that some distraction is not problematic for most students, but the students that deserve attention are the ones who use technology to disengage from the learning experience. For example, a student who invests time and energy online to pursue non-academic activities may consequently attend class unprepared.

Weisskirch (2004) conducted a study at a small suburban California State University to examine 'sensation seeking' behaviors of college students. This term is defined as "varied, novel, complex and intense sensations and experiences and the willingness to take physical, social, legal, and financial risks for the sake of such an experience" (p. 189). Although only 138 students participated (on one campus) their results indicate that the number of casual and close friends on the Internet was positively associated with sensation seeking. Individuals who reported using the Internet in the 24 hours prior to completing the instrument for the purposes of viewing sex-oriented material, downloading music, playing games, or to chat in IM showed higher levels of sensation seeking than those who used the Internet for other purposes. Thus, because sensation seeking is defined by the author as a risk-taking venture, this form of behavior is should not be viewed as an educationally sound practice and may not benefit students in terms of engagement.

While literature on the interaction between student use of socially interactive technologies and engagement appears to be limited, the material found to date suggests that use of technology may, or may not, enhance the student experience in terms of engagement.

Overview of Literature

The literature presented in this paper suggests several observations and conclusions regarding the coverage of the material to date. First, the literature on cohorts appears to be well-established in that it demonstrates how cohorts differ from one another, evolve, and interact with the larger society (Ryder, 1985). Second, this literature also provides a background or lens through which to view the current generation of college students (i.e. Millennials, Net Gen, etc.). While some of the literature discussed in this section above is based on more journalistic sources (i.e. Howe & Strauss, 2000) than empirical study, the research studies on student use of technology do suggest that socially interactive technologies play a large and ever-growing role in the lives of students on college campuses today (Nelson Laird & Kuh, 2005). As time and research moves forward, I anticipate that more data will be collected on the ways in which students use technology, and to what extent (Bryant et al. 2006). Finally, the constructs of involvement (Astin, 1993) and engagement (Kuh, 2003) appear to be well-researched and established among research in higher education as they relate to the student experience. The investment of time and energy into the college experience benefits students in terms of growth, development, and learning. While a small body of research has been conducted on the relationship between student use of socially interactive technology and engagement (Nelson Laird, 2004), no conclusive evidence exists to demonstrate whether this practices positively or adversely impacts the overall student experience.

As stated in the introduction, boyd (sic) and Ellison (2007) suggest that the research on certain use of social technologies represent a vast and uncharted topic still to

be explored. "Methodologically, SNS researchers' ability to make causal claims is limited by a lack of experimental or longitudinal studies…scholars still have a limited understanding of who is and who is not using these sites, why, and for what purposes…" (p. 15). In addition, the use and preference of SITs in communication is on the rise. The literature states that a better understanding of the relationship between technology and today's youth will lead to a more constructive means of enhancing their lives (Bryant, et al., 2006). According to Haythronthwaite and Wellman (2002), as time goes on, and as time spent online increases, the amount of connectivity to others will increase as the number of people that have access to the Internet increases. This may prove to change how students engage themselves and their respective institutions during the college experience. On one hand, technology may facilitate quality interactions that encourage engagement, or technology may also present barriers to students being more involved (Nelson Laird & Kuh, 2005). Thus, further research is needed to understand how student use of technology impacts the college experience. The next section of this study illustrates the research method utilized to better understand these phenomena.

Chapter Three: Methodology

This chapter describes the research design and analytic strategy of this study including a description of the research participants, instrumentation, pilot study, and implementation, data collection, and analyses. Because the topic involves two unique constructs, items from two distinct and existing instruments will be combined to form one instrument. The two instruments are a modified version of the Net Generation survey (Junco & Mastrodicasa, 2007) which captures the intensity of student use of technology, and selected items from National Study of Student Engagement (NSSE), which demonstrate student engagement at the host institution. Implementation and data collection took place in the 2009-2010 academic year. Following descriptive and bi-variate analyses, I conducted a factor analysis and a series of regression analyses in which the primary independent variables are student use of technology media, and the dependant variables are selected aspects of student engagement during the undergraduate experience.

Population and Sample

The population sampled consists of third and fourth year college undergraduates at a mid-sized, doctoral-granting, private university in New England. The population studied was the junior and senior academic classes of 2010 and 2011. This population was sampled for several reasons. First, if the implementation was in the fall semester, the first-year class would not have sufficient time to become engaged on campus. Second, the sophomore class at the host institution was given the full NSSE survey during their freshman year in the spring semester of the 2008-2009. Given this, sophomores might

either resist completing another survey related to student engagement, or presume that it is too similar to the study in which they have already participated.

The population of juniors and seniors is approximately 4000. A random sample of this population was provided by the institutional research department at the host institution. After reviewing a statistical power analysis, at a 95% confidence level, the target number of responses was nearly 350. Given that response rates can be low, a random sample of 1000 students was created in an effort to yield a desired response rate.

Instrumentation

As noted above, the data used for analysis was collected via a combination of items from two different instruments. Copies of both instruments can be seen in the Appendices of this study. The first instrument, NSSE, is given to both first-year and senior students at participating institutions nationwide. Since the inception of this instrument in 2000, more than 900,000 students from nearly 1000 different four-year institutions have participated in the survey. The instrument is given to undergraduate students, and data are reported to participating institutions for comparison to peer institutions as well as to national averages (Kuh, 2005). NSSE measures two essential components of student engagement. The first component measures the educationally purposeful activities to which students devote their time and energy such as studying, reading and writing, interactions with both peers and faculty members, and experiences with diversity. It also measures the quality of the relationships formed with faculty, student peers, and administrators. The second component measures what institutions do to facilitate or enhance student engagement such as pedagogy, programs and services, and aspects of the campus environment that induce students to take part in educational

activities. Ultimately, NSSE yields scores on five important clusters of educational practices or benchmarks. These include academic challenge, active and collaborative learning, student-faculty interaction, enriching educational experiences, and supportive campus environment (Kuh, 2005). For the purposes of my study, twenty three items were borrowed from the NSSE instrument that allowed me to measure the dependent variable. The following paragraphs discuss my rationale for the selection of these items in my study.

The College Student Report (formal name of the NSSE instrument) is broken down into sections which contain items that measure certain aspects of engagement. The first of these sections includes items on 'college activities' that represent activities in which students engage both inside and outside of the classroom. The 22 items in this section include studying, socializing, working, and participation in extracurricular activities (Kuh, 2001). Sample items from this section include: "in your experience, how often have you 'used e-mail to communicate with an instructor"; and have "had serious conversations with students from a different race or ethnicity than your own"? These items are all scored on a four-point scale ranging from 'very often' to 'never'.

In a psychometric analysis of the Report, Kuh (2001) discusses an overview of the goals and premise of the NSSE study, as well as the validity, reliability, and stability of the instrument. I followed the psychometric properties reported in this paper to select items that form independent factors and kept them together in my study so as to not change the reported validity and relationship between the items. In terms of this initial 'college activities' section, the instrument asks students to respond to questions related to the in-class experience. As noted in Chapter One, these items were excluded because my

study centers on the student experience and engagement via socially interactive technology, as opposed to their in-class experience. However, there are three items in this section that clustered together statistically that Kuh (2001) labels as the 'diversity' factor in college activities. More specifically, the items in this factor include the responses to the questions have you: "had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values"; "had serious conversation with student of a different race or ethnicity than your own"; and "discussed ideas from your readings or classes with others outside of class?" Responses are measured on a four-point scale ranging from 'very often' to 'never', and account for 6.1% of the variance for the 'college activities' section on the NSSE instrument (Kuh, 2001). Thus, within the construct of college activities, these three items form a single 'diversity' factor. These three items were included in my study for two reasons. First, they all involve a communication element (that can also take place via the use of technology) and second, research suggests that "the actual effects on student development of emphasizing diversity and of student participation in diversity activities are overwhelmingly positive" (Astin, 1993, p. 431). Thus, engagement in these types can have positive outcomes during the undergraduate experience.

The second section of the instrument includes items which seek to understand the extent to which students spend their time in educationally purposive activities. For example, items here include length of papers, the level of challenge of exams, academic advising, and higher order mental activities such as analyzing, synthesizing, evaluating, and applying academic materials (Kuh, 2001). For the purpose of my dissertation study, items in this particular section were excluded. My research examines how socially

interactive technology is related to engagement, and whether or not this relationship has positive or negative impacts on the college experience. Again, according to Astin (1993) involvement in campus activities is associated with positive outcomes. My question then seeks to understand what, if any, role these new media play in terms of involvement. Put simply, I am interested to better understand these behaviors in terms of what students *choose* to do, as opposed to what they are *required* to do by their institution.

The third set of items relates to educational and personal growth during the college experience. Items include general knowledge, written and oral communication skills, intellectual skills, social and ethical development, and vocational preparation (Kuh, 2001). As stated in the literature review, the use of technology by college students may impact engagement in several of these areas (Bryant et al., 2006; Marx, 2000; Oblinger, 2003). Thus, the items in this section measuring educational and personal growth during the college experience were included in my study.

As noted in the 'college activities' discussion above, a series of items that cluster together that are pertinent to my study are contained within the 'educational and personal growth' construct. Here seven items cluster together to form a 'personal-social' factor and account for 41.7 percent of the variance for 'educational and personal growth' section (Kuh, 2001). Items included in this factor assess to what extent participants' experience at the institution contributes to their knowledge, skills, and personal development in areas such as: developing a personal code of values and ethics; understanding oneself; understanding people of other racial and ethnic backgrounds; contributing to the welfare of your community; solving complex real-world problems; learning effectively on your own; and voting in local, state, or national elections.

Responses are measured on a four-point scale ranging from ‘very much’ to ‘very little’. As noted above, many of these activities are considered out of classroom experiences, and time spent on technology use may take away from time dedicated to these pursuits (Gemmill & Peterson, 2006). In addition to being relevant to my research question, these seven items were used in my instrument to not change the reported validity and relationship between the items, as well as the overall factors to which they contribute.

One section of the 2008 NSSE instrument that was not evaluated in the principle component analysis for the conceptual framework and psychometric study (Kuh, 2001) includes a series of items not necessarily related to a student’s in-classroom experience. Items included in this section ask participants during the current school year, the frequency with which they have: attended an art exhibit, play, dance, music, theater, or other performance; exercised or participated in physical fitness activities; participated in activities to enhance spirituality such as worship, mediation, or prayer; examined the strengths and weaknesses of your own views on a topic or issue; tried to better understand someone else’s views by imagining how an issue looks from his or her perspective; and learned something that changed the way you understand an issue or concept. Items are ranked on a four-point scale from ‘very often’ to ‘never’. While the inter-correlation of these items is not discussed in Kuh’s (2001) review of the psychometric properties of the instrument, they make up a section of the instrument consisting of six items. Before data collection, depending on the relationship and correlations of responses, I sought to conduct my own independent factor analysis and create an engagement factor to study its relationship with use of technology. Following data collection and analysis, I made several empirical and research decisions as to how to

use these items. Regardless of the end result, my rationale for initially including these items was that these activities are central to the student experience and how students communicate with one another. In addition, because the literature suggests that time spent on technology takes away from involvement and engagement activities (Gemmill & Peterson, 2006) it will be important to understand if students who are more frequent users of technology are participating in these activities.

A second section of the NSSE instrument that was not included in the conceptual overview and psychometric properties study includes a student's commitments outside of the classroom as well as a measure of time spent with peers and family. Items in this section ask students to report the number of hours in a typical week that involve: preparing for class; working for pay on campus; working for pay off campus; participating in co-curricular activities (organizations, campus publications, student government, intercollegiate or intramural sports, etc.); relaxing and socializing (watching TV, partying, etc.); providing care for dependants living with you; and commuting to class. Each of these items are reported on an eight-point scale ranging from zero hours per week to over thirty hours per week. Astin (1993) reports that these items have an impact, all within varying degrees, while a student attends college. For example, he notes positive outcomes for participation in co-curricular activities, and several negative outcomes for items such as time spent watching television and commuting to campus. Because these behaviors play a role in a student being involved (or engaged) in the college experience, they were included in this study. Again, the role technology plays in students' participation in these activities is central to the research question. As stated in the proceeding discussion, following data collection and based on the results of a factor

analysis, I made several empirical and research decisions as to how to use these data. The results of this process are described in greater detail in Chapter Four.

The final sections of the NSSE instrument seek to measure student satisfaction with the respective institutions as well as to collect demographic information. As my study focuses on the relationship between technology use and student engagement, as opposed to satisfaction with the host institution, these items were excluded from my study.

To summarize the items adopted from the NSSE College Student Report, the four measurements of engagement are: diversity within college activities (a three-item factor), personal-social growth (a seven item factor), non-classroom experience (six items), and miscellaneous student activities (seven items). Note that in the discussion above, I conducted my own analyses on these latter two sections and determined their relationship and correlation with other items. This analysis then determined how the items (or factors) were used in the regression analysis (discussed in Chapter Four). An illustration of the items borrowed from the NSSE survey is displayed in Table 1 (p. 60).

To establish validity and reliability for The College Student Report, Kuh (2001) reports that psychometric analyses of the instrument were extensively conducted from 1999-2001. More specifically, the psychometric properties were conducted on 3226 students in the spring of 1999, 12,472 students in the fall of 1999, 63,517 in 2000, and 89,917 students in the spring of 2001. Several important findings of research regarding the psychometric qualities of The College Student Report are noted below. First, in terms of measuring reliability, a test-retest study was done on 569 participants. Using a

Pearson product moment correlation, the reliability coefficient for all students across all items resulted in a Chronbach's alpha of .83 (Kuh, 2001). Thus, this discussion suggests that the instrument has a high degree of reliability. Second, Kuh (2001) warns that self-reported information may be subject to the halo effect, which refers to the possibility that students may inflate several aspects of their behaviors such as grades, amount learned through a certain activity or program, or the level of effort put forth in campus activities. In essence, while students may inflate their responses, it appears that this is common across samples so as to not advantage or disadvantage one institution or student group over another. Given this, it appears as if the halo effect does not pose a threat to validity. Third, Kuh (2001) also states that the College Student Report questionnaire items have a higher degree of validity because they satisfy several important conditions when working with self-reported data. These include clearly phrased questions referring to recent activities, the answers are known by the respondents, participants think the items warrant a serious and thoughtful response, and the questions are not threatening in terms of privacy and causing embarrassment. Finally, Kuh (2001) notes that most of the items on the NSSE College Student Report have been used in other long-running and well-regarded college student research programs such as Indiana University's College Student Experiences Questionnaire Research Program, and UCLA's Cooperative Institutional Research Program. In summarizing the discussion on the NSSE instrument, it appears to be reliable, has a high degree of validity, and is widely accepted as a resource for better understanding student engagement at differing institutions. Thus, the questions included in this study on the final instrument have a basis for reliability and have a high degree of validity as well.

Before discussing items addressing student use of technology, it is important to note that I entered into an Item Use Agreement with the executives at the NSSE research institute. This instrument is copyrighted, and as such, permission was obtained to use items in this study (J. Kinzie, personal communication, May 30, 2009).

The second instrument that was combined into this study's instrument is the Net Generation Survey originally authored by Junco and Mastrodicasa (2007). This instrument consists of 56 items inquiring how students use socially interactive technologies. These include: cell phones, instant message programs, computers and the Internet, e-mail, and social network sites (SNS). Demographic information is also collected.

While the data presented as a result of the Net Generation survey offer a wealth of descriptive statistical information, the authors of the instrument did not conduct specific reliability or validity analyses. The survey was piloted and peer reviewed, but no specific information (such as Cronbach's alpha) was published. As this was a descriptive study only, it did not measure constructs and each question was interpreted independently. According to the researchers, it is possible to create a scale that reflects a certain construct (i.e. Internet dependence) based on the results from a factor analysis on multiple items (R. Junco, personal communication, May 6, 2008). For my study, correlation analyses were conducted to determine how, and to what degree use of the differing media relate to one another. After a factor analysis, I then determined that a technology use factor could be created and used in a regression analysis. As the original researchers (Junco & Mastrodicasa, 2007) note above, it was possible to create and label a construct that captured overall socially interactive technology use.

The Net Generation Survey (Junco & Mastrodicasa, 2007) consists of five sections inquiring how students use socially interactive technology. Each section addresses the frequency and amount of use for four technology media. Respectively, these include cell phone, including text messaging, electronic mail, instant messaging, and use of social networking sites such as Facebook or MySpace. For example, items include questions such as 'on average, how much time each day do you spend talking on your cell phone' and 'on a typical day, how mach time do you spend actively sending and receiving instant messages'? The final section collects demographic data such as age, gender, ethnicity, major field of study, and estimated household income.

For the purposes of my study, items assessed how many hours, in the average day, each student spends talking on a cell phone, sending and receiving text messages, using an instant message system, surfing social networking sites, and e-mailing others. Items were scored in hourly increments from '0' hours per day, up to '10+' hours per day. In terms of demographic data, several participant characteristics were recorded and included in the analyses. These included sex, academic college of study (Business, Arts & Sciences, Education, or Nursing), place of residence (in a residence hall on campus, or off-campus), and ethnicity (AHANA, or White non-AHANA). Note that the term 'AHANA' is used at the host institution and encompasses African, Hispanic, Asian, and Native American students.

As noted above, selected items from both instruments were combined to form the Net Generation and Engagement Survey. Items selected gave relevance to the topic and the literature reviewed to date. For example, the NSSE instrument has numerous items related to the in-class experience such as time spent memorizing facts, analysis of theory,

number of assignments, length of papers, and time dedicated toward examinations. These items may measure the rigor of an academic program, but do not illuminate use of socially interactive technology for the purpose of being engaged. Again, items used from NSSE are those relevant to my research topic such as: items addressing participation in diversity activities, attendance at an art exhibit or other performance; participation in campus activities; time commitments away from campus; and measures regarding relationships and discussions with other students, faculty, and staff. In addition, the Net Generation survey asks students questions regarding their primary source of news gathering – the Internet, blogs, network or cable news, etc. Rather than selecting these items, I used those that measure types and frequency of technology use, such as time spent on a cell phone, instant messaging, Facebook, etc. This is not to say that excluded items from both instruments do not measure important traits of college students today, but rather those that were included measured how technology is used for social interactivity and engagement. In addition, not only do some items on both instruments prove to be irrelevant for my research question, combining both instruments in their entirety would result in a lengthy instrument of nearly 150 items. A copy of the NSSE instrument appears in its entirety in Appendix A.

In addition to the quantitative portions of final instrument, an open-ended qualitative question was included before recording participant demographics. This essentially asked students the overall research question in layman's terms. The question was worded "In what way(s) do you feel the technology devices mentioned in this study either help or hinder your experience as a college student?" Responses to this question were coded and categorized into themes and are illustrated in detail in Chapter Four.

Demographic information used in this study was recorded at the conclusion of the instrument (discussed below). The final research instrument containing all items and the informed consent for participants appears in Appendix B.

Implementation

The final instrument was loaded into an online survey product (Survey Monkey) and e-mailed to the sample. In the full administration of the instrument, the privacy of the sample was protected by Survey Monkey and no personal information identifying the participant was ever known to the researcher.

Implementation of the finalized survey instrument incorporated elements of Dillman's (2001) 'Tailored Design Method' which in essence, seeks to "reduce survey errors from coverage, sampling, measurement, and nonresponse" (p. 27). Several aspects of the implementation process can shape trust and influence the respondents' expectations for reward and trust. First, Dillman (2001) suggests that in an effort to establish trust with participants, researchers should make participation appear important, provide rewards, and be sponsored by a legitimate authority (i.e. in this case, Boston College). Second, researchers can increase rewards of participation by making the instrument interesting, showing positive regard for participants, saying thank you, and giving social validation. Finally, to reduce social harms of participating, I avoided requesting personal information, embarrassing items, subordinating language, and inconvenience (i.e. offering an e-mail and web based survey). These elements suggested by Dillman (2001) were included to assist in increasing the number of participants, decreasing non-response, and thereby increasing the power of the statistical results.

The sample population was e-mailed the request for participation and the link to the instrument. This included a statement of privacy and participant consent that also included a notice of possible risks and rewards for participation. The instrument allowed students to participate for a period of one week. Following the first week, non-respondents were filtered by the Survey Monkey software and were subsequently sent a reminder and request for participation. This served as the second and final reminder. The instrument was taken off of the web site for participant use after the second week passed.

Given that this study examined the use of technology, entry into a drawing for iTunes gift cards (downloadable music stores) served as an incentive for students to participate. Students opting to participate in this drawing provided email addresses along with their responses. Note however, the email addresses were stored on an Excel spreadsheet (one per row) separate from the data set so that they could not be linked to participant responses, thus ensuring anonymity. Eight twenty-five dollar gift cards were offered after a random number generator provided row numbers in the Excel spreadsheet corresponding to participant email addresses.

Finally, it should be noted that all appropriate human subject guidelines and research credentials were submitted for review at the host institution. All IRB guidelines were met, and project was approved by the host institution in the Spring of 2010.

Pilot Study

In the summer of 2009, the proposed survey was administered to a group of college students at a neighboring institution. In total, 35 students participated and I was

able to better understand the implementation of an online survey, and how to download data into an SPSS spreadsheet for future analysis.

In addition to the quantitative instrument, I included three qualitative questions at the conclusion of the survey which inquired about the understanding of the questions as well as possible incentives for student participation. The first question asked whether the questions were worded clearly and were understandable. Almost all of 31 students who chose to answer this question supported the notion that the items were clear and understandable. This was not surprising, given the history and thorough testing that NSSE conducts on the College Student Report (Kuh, 2001). The second question asked participants if they would suggest any revisions or the rewording of any item. A theme that emerged here is that students use socially interactive technologies at various points throughout the day, as opposed to hour long increments of time (as items response options list). In other words, the wording of the question should include the notion that the daily use is of a cumulative nature, or ask students to somehow estimate the total number of hours over a 24-hour day, as opposed to use in specific sittings. Finally, the third qualitative question in the pilot study asked students to offer suggestions on an appropriate incentive to participate in the study. Responses here were nearly unanimous in that students wanted gift cards to be used for online purchases, or for a campus-based coffee shop and restaurant. Thus, I decided to retain my original thought of iTunes gift cards as my incentive for student participation.

Analysis

Following data collection, the analysis began with a descriptive analysis of demographic information and technology use. In addition, descriptive statistics (i.e.

mean, median, mode, and standard deviation) are presented as well as a correlation matrix that numerically describes the strength, direction, and significance of any relationship between technology media. In addition, following factor analyses, regression analyses allowed me to explain the variability in student engagement as a function of the variability of technology use. Specifically, the regression models determined whether use of technology is a significant predictor of (selected) student engagement. These results are discussed in Chapter Four.

The data analysis begins by discussing each of the items related to type, or media, of technology use. The five technology media were scored by use of cellular phones, text messaging, e-mail, instant message programs, and social networking sites in hours per day. Each mean is a measurement of the intensity of technology use in that the daily time spent on each are reported. The scores for each of the media created variables such as 'cell phone use' for each of the five media mentioned above. Statistical frequencies such as mean and standard deviation provide readers with a better understanding of how students responded in each media type. These summed scores for media constitute five independent variables whose contribution to variability in engagement were modeled in the regressions.

In terms of the engagement items from the NSSE instrument, the 23 items were analyzed in terms of their sub-factors discussed above. These include diversity within college activities, personal-social growth, participation in non-classroom experiences, and miscellaneous student activities. Again, the items in these latter two sections of the instrument were not reported as factors by NSSE (Kuh, 2001), and I assigned their initial

labels. Based on item correlation, a factor analysis demonstrated any possibility to cluster several or all items together into unique variables.

At several points throughout this discussion, I have made reference to conducting factor analyses on items to explore the possibility of creating factors. Kim and Mueller (1978) suggest using SPSS outputs that contain means and standard deviations of all variables, the correlation matrix, an unrotated initial factor matrix, regression weights with which to construct factor scales, and a visual plot (scree plot) of the clustering of variables for each factor. This procedure, along with the outputs, allowed me to analyze the variables (items) in terms of smaller, simplified, factors. It is possible through this procedure to better understand which items cluster together to form underlying factors that are responsible for the observed variables (DeVellis, 2003). In terms of the dependent engagement variable, two factors already exist from the NSSE psychometrics – the 'diversity' in engagement, and 'personal-social' engagement, as listed in Table 1.

With these procedures completed, I took the five media that make up the use of technology portion of the instrument and used a bi-variate correlation to pair each of the media with one another. Each media type was measured with one another and a factor analysis revealed that it was possible to create an overall technology use variable (factor). The procedures for this analysis are discussed in detail in Chapter Four.

Following the descriptive statistical analysis, the bi-variate description of study variables, and a factor analysis on the engagement items, a regression procedure was used to determine the proportion of the variance that accounts for each separate factor of student engagement. In addition to the technology use factor noted above, the predictions

included demographic data of sex, school of academic study, place of residence, and ethnicity.

A multiple regression equation for this study can be represented by:

$$Y' = a + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5$$

Where: Y' = Predictor variable (in this case, an engagement factor)

a = constant or intercept

b = the regression coefficient

X_1 = Technology use factor

X_2 = Academic school of study (Arts and Sciences, Business, Education, Nursing)

X_3 = Sex

X_4 = Residence (on or off campus)

X_5 = Ethnicity (AHANA or White)

As an example, the regression equation for the first engagement variable, understanding diversity, can be illustrated as:

$$Y'_{diversity} = a + b_1 X_{techno\log yuse} + b_2 X_{school} + b_3 X_{sex} + b_4 X_{residence} + b_5 X_{ethnicity}$$

Note that the factor analysis for the engagement sections of the NSSE survey (discussed previously), yielded a total of three factors, and a regression procedure was employed with a similar method and formula as well.

Finally, an analysis of the qualitative question was conducted. The method used in this process was similar in nature to open and axial coding as discussed by Neuman (1994). While reviewing the data, I assigned a label or code to each of the statements in an effort to bring themes to the surface from within the data. In axial coding, the focus

moves from the data themselves to the codes assigned to each response. The codes were then divided into categories and groups of responses that clustered together. I then organized responses into a series of themes that sought to support and answer the research question. Finally, themes were organized in a format for appropriate presentation to readers, as discussed and illustrated in Chapter Four.

In conclusion, the methodology for studying the relationship between student use of socially interactive technology and engagement in the college experience involves several different analytical procedures, both quantitative and qualitative. Items from the two pre-existing instruments and demographic data were analyzed in terms of descriptive statistics, factor analysis, and regression analyses. In addition, an open-ended response generated qualitative data that provide an illustration of the views and opinions of participants. Combined, these results provide a better understanding to how students use social media, and how this plays a role in engagement in their lives as college students.

Chapter Four – Results

The purpose of this chapter is to discuss and illustrate the results of the statistical analyses as well as the qualitative analysis from the open ended item on the survey. The chapter is organized into several sections. First, the sample is illustrated with a description of participant demographics and selected characteristics. In addition, participant responses are illustrated in terms of technology use and frequency. Second, correlative data is discussed to demonstrate the relationships between variables. Third, a factor analysis was completed on the dependent engagement variables as well as the independent technology variable. Following the factor analysis, a regression model and analysis demonstrates the findings of the technology factor and demographic variables predicting levels of student engagement. Finally, the qualitative analysis is reviewed to illustrate in the participant's own words how socially interactive technology plays a role in their college experience.

Sample

As discussed in Chapter Three, the survey instrument was sent to a sample of 1000 junior and senior students at the host institution in the Spring semester of the 2009-2010 academic year. After one week, a reminder was sent to participants, and the survey was taken offline after giving participants a two week period to finish the instrument. In total 154 students completed the instrument resulting in a participation rate of 15.4 %.

Background of Participants

The background information collected on the participants provides an overview of the sample collected. Participants were asked to report their sex, college of study (within the larger institution), residence (in campus residence halls or off-campus), and ethnicity

(AHANA, or White non-AHANA student). See table 2 for an illustration of the demographic data discussed in this section.

First, the majority of students participating in the study were women, with a total of 64%, compared to 35% males. Note that institutional data suggest that the female to male ratio is much closer to an even split between the two sexes. Thus, the participants in the study include more females, which is not representative of the overall population. Second, the majority of students reported that they were members of the College of Arts and Sciences, followed in number by those in the School of Management, School of Education, and School of Nursing. Interestingly, the percentage of students in the study coincides very closely with the percentages of total students in each of these colleges at the host institution. Thus, in terms of academic college the participants are representative of the larger population. Third, nearly three-quarters of students in the study reported their place of residence as on-campus, and one quarter stated that they lived in an off campus residence. One student reported living both on and off campus, presumably splitting the semesters between housing arrangements. Similar to the demographic of academic college, these data are in line with the overall population data of the larger institution. Finally, the vast majority of participants in this study report being White, non-AHANA students. While the host institution reports that the majority of students are White, institutional data report that the split between White non-AHANA and AHANA students is a 75/25 difference. Thus, participants report as being White and non-AHANA at a higher rate than those students enrolled at the host population. Again, Table 2 illustrates the demographic data discussed in this section.

Table 2

Sample Demographic Information and Population Total

Demographic	n	%	Population % (Institution)
Sex			
Male	54	35	48
Female	99	64	52
Academic School			
Arts and Sciences	102	66	67
School of Management	30	20	21
School of Education	13	8	7
School of Nursing	7	5	4
Residence			
On Campus Housing	114	74	81
Off Campus Residence	38	25	19
Ethnicity			
White	131	85	75
AHANA	22	14	25

Note: Institutional data found in host site Fact Book

Technology Use

To begin a discussion on the level of technology use, the numbers of hours, inclusive of all media types were totaled across all participants. The mean score for total number of hours is 7.78 hours per day, the median number of hours per day is 6, and the mode is 5 hours per day. This suggests that regardless of which type of medium a participant chose (or combination thereof), students in this study spent nearly 8 hours per day on social technology.

When examining the mean scores reported by participants in terms of a specific social technology medium, it appears that Social Networking Sites (SNS) have the highest level of use per day. This is followed by text messaging, email, cell phone, and Instant Message. Median and mode scores were not reported above 2 hours per day. In terms of median scores, both email and social networking report the highest scores of hours per day. Mode scores are similar across all technology media, with the exception of Instant Messaging. Interestingly, Instant Messaging recorded the lowest mean,

median, and mode scores of all five social technologies. Table 3 illustrates the descriptive statistics for the items recording use of socially interactive technology.

Table 3

Descriptive Statistics for Daily Technology Use by Medium

	Socially Interactive Technology (SIT) Media				
	Cell Phone	Text Message	Email	Instant Message	SNS
N					
Reported	153	152	151	152	151
Missing	1	2	3	2	3
Mean (hours/day)	1.07	1.95	1.91	.80	2.01
Standard Deviation	.804	1.98	1.25	1.2	1.69
Median (hours/day)	1	1	2	0	2
Mode (hours/day)	1	1	1	0	1
Sum (total hours/day)	164	296	288	121	303

When examining the frequency distribution of responses within each type of social technology, several noteworthy observations emerge. First, the vast majority of participants report using each of the media two or less hours per day. While all have reported numbers greater than two hours, text messaging, email, and SNS report students with great numbers, as well as several high-end users. Second, the most common response to hours per day spent on Instant Messaging was zero. While students did report numbers greater than zero, this particular medium stands out as a less popular means for communication by participants, especially when examining the number of hours spent on other media. Third, the total scores by participants of hours used on social technology report that social networking, text messaging, and email are the highest by total, and are relatively close in score. Following these three, there is a drop in use of cell phone and Instant Messaging, with this latter medium showing the lowest number of total use by far.

Table 4 illustrates the specific number of hours per day reported by participants in percentages, and totals via media type.

Table 4

Frequency of Technology Use by Medium

	Socially Interactive Technology Media				
	Cell Phone	Text Message	Email	Instant Message	SNS
Hours/ Day	%	%	%	%	%
0	18	10	1	58	7
1	64	47	43	19	40
2	12	20	34	13	29
3	3	8	14	6	7
4	3	5	4	1	9
5	0	2	1	2	1
6	0	2	0	1	2
7	0	0	0	0	1
8	0	1	1	0	1
9	0	0	0	0	1
10	0	3	1	0	1
Sum (hours/day)	164	296	288	121	303

In an effort to examine the range of time participants dedicate to social technology, technology use data were divided into four even quartiles (n=38, 39) of respondents. To assign a label to the four quartiles, they range from lowest users, second quartile, third quartile, and highest users. Thus, students can be categorized from low-level users to high-level users.

Table 5 shows participants' use of social technology in mean scores, with standard deviations, broken into quartiles. Note that the mean scores and their respective standard deviations increase dramatically into the fourth quartile, again suggesting that a number of outliers exist at high levels.

Table 5

Time on Technology (in Quartiles) by Medium

	Mean time in hours/day (Std. Dev.)				
Quartile	Cell	Text	IM	Email	SNS
Lowest	.26 (.45)	.59 (.5)	0 (0)	.97 (1.7)	.69 (.47)
2nd Quartile	1.0 (0)	1.0 (0)	0 (0)	1.2 (.39)	1.0 (.16)
3rd Quartile	1.0 (0)	1.7 (.48)	.64 (.49)	2.0 (0)	2.0 (0)
Highest	2.0 (.92)	4.5 (2.5)	2.5 (1.2)	3.4 (1.5)	4.2 (1.9)

Technology Use by Demographics

Cross tabulations were used in SPSS to examine how technology use varied by reported demographic characteristics. Each of the five media (cell phone, text, Instant Message, email, and SNS) were crossed with the four demographics (sex, school, residence, and ethnicity) and the SPSS Outputs were analyzed and discussed in this section. In studying these data, the demographic categories of sex and ethnicity were the only two that provided significant results. For example, the sample population is heavily skewed toward students who live on campus because the population is overwhelmingly residential. Students reporting to live 'off campus' generally live within the local community and in close proximity to the host campus – they are not students who live at home with family members and personify the notion of a 'commuter' student. In addition, a participant's academic school was non-significant as well, given the low response rates in the School of Education (13) and the School of Nursing (7). Therefore, student demographics by category of sex and ethnicity are discussed in this section.

In terms of sex, females reported higher levels of Socially Interactive Technology (SIT) use than males across all media. Most notably, approximately one-third of males reported technology use in the lowest (first) quartile. The same holds true with the

converse – while not as great of a difference, females reported use in the highest quartile more than their male counterparts.

To demonstrate this, Table 6 illustrates the lowest users of social technology reported by sex. A Chi-square test was run on the data and significance on expected versus observed results are reported. Note that the Chi-square test reported the significance across all quartiles, as opposed to just those listed within the lowest quartile (below). After determining the significance of the entire table(s), I examined the n scores for each quartile by media to determine where the significant difference existed.

Table 6

Lowest Quartile of Technology Use by Participant Sex

Medium	% Male	% Female	Sig
Cell Phone	37	18	.08
Text	39	17	.02*
Email	37	18	.07
Instant Message	30	22	.38
SNS	30	22	.69

*Sig. = $p < .05$
Note: cell phone Pearson $X^2 = 6.76$ (df 3)
Text Pearson $X^2 = 9.59$ (df 3)
Email Pearson $X^2 = 6.92$ (df 3)
Instant Message Pearson $X^2 = 3.07$ (df 3)
SNS Pearson $X^2 = 1.47$ (df 3)

In terms of ethnicity, AHANA participants reported use in the highest quartiles at a significant level in three different SITs than their White counterparts. These include email (55% AHANA vs. 20% White), Instant Messaging (41% vs. 22%), and social networking sites (41% vs. 22%).

Technology Correlations

When examining the correlations among participants' use of the five social media studied in this project, it is first notable that all of the correlations are positively associated. In other words, higher use of one social medium along a continuum does not indicate lower use of another. The highest correlation reported is between use of email and text messaging (.50), perhaps because many students use a single device, such as a cellular phone (i.e. Blackberry or other PDA device) to connect with others using both types of media. The highest correlations following this are all related to use of social networking sites. These include the association of SNS with use of email (.42), text messaging (.39), Instant Messaging (.36), and cell phone use (.28), respectively. These data may speak to the popularity of social networking among participants, and the ease and convenience with which students use this media in conjunction with others.

Notably, the only two items which show a lowered or non-statistical correlation are instant messaging and email. Interestingly, both of these media are commonly used on desktop and laptop computers via a main screen or home page and are accessed through the same technology hardware. Thus, it would be reasonable to assume that these media would be more tightly coupled and demonstrate a positive correlation.

Table 7 illustrates the strength and direction of correlations among the five socially interactive technology media researched in this study. Note that all correlation coefficients are positive.

Table 7

Pearson Product-Moment Correlations Among Socially Interactive Technology Media

	Cell Phone	Text Message	Email	Instant Message	Social Network
Cell Phone	1				
Text Message	.22*	1			
Email	.25*	.50*	1		
Instant Message	.17*	.19*	.13	1	
Social Network	.28*	.39*	.42*	.36*	1

* Sig.= .05

Factor Analysis

This section will provide an overview of the factor analysis of both the dependent variables as well as the independent variables as discussed in Chapter Three. This illustration will begin with an overview of the factor analysis process, and will then go into detail regarding the analysis on each of the variables examined in this study. Included with the analysis will be my rationale for decisions made in terms of inclusion or exclusion of certain items as well as statistical support for these decisions.

DeVellis (2003) states that factor analysis serves several important purposes in data analysis. First, factor analysis assists investigators in understanding how many latent variables underlie a certain set of items. Thus, an investigator can determine if a multiple item instrument can be explained by one or several broad constructs which capture or characterize items in the data set. Second, factor analysis may explain the variation in many instrument items by condensing information so that the variation can be explained by a smaller number of variables. For example, in a 25 item instrument, it is possible to compute a smaller number of scores by combining certain items into a smaller score (or factor). Finally, factor analysis can also "define the substantive content or meaning of the factors (i.e. latent variables) that account for the variation among a larger set of items" (p. 103). For example, if two factors emerge from a multiple item instrument, the individual items making up the factors may provide information about the latent variables represented by the factors. In essence, the groups of items that make up a factor covary with each other, and assist in defining the underlying latent variables. Statistical packages such as SPSS (as used in this study) can provide investigators with statistical insights into the formation of factors, decision making in regards to which items contribute to certain factors (factor loadings), and assist in understanding the latent variables which capture the individual items (Kim & Mueller, 1978). My use of SPSS and the statistical analyses of each of the factors making up the independent variable (technology use) as well as the dependent variables (engagement constructs) are discussed throughout the remainder of this section.

In determining what factors exist to explain multiple items, DeVellis (2003) suggests that two widely accepted guidelines for extracting factors from a set of variables

(the items) are use of the eigenvalue rule as well as the scree plot. Eigenvalues are a representation of the total amount of information contained in a factor. For example, in a hypothetical analysis of 25 items, there would be a total of 25 units of information. As each factor's eigenvalue corresponds to some portion of these units, a factor's eigenvalue in this data set of 5.0 would thus mean that the factor contains 20 percent of the total information (or 5/25). An eigenvalue of 2.5 would similarly mean that the factor accounts for 10 percent of the total information of the items (or 2.5/25). As DeVellis (2003) goes on to state, factors which have an eigenvalue of less than 1.0 should not be retained. Eigenvalues greater than 1.0 would thus mean that the factor is more information-laden than the individual items. Scree plots are also based on eigenvalues and are illustrations of the eigenvalues of individual factors extracted from a set of variables. For example, if three factors were extracted from a set of variables, their respective eigenvalues would be represented on the x-axis, while the corresponding number of the factor would be plotted on the y-axis. On a graph, the shape would be characterized by a predominately vertical portion on the left, and decline to the right into a relatively horizontal pattern. Simply stated, an ideal progression of factors on a scree plot would demonstrate that factors would drop sharply with the information laden factors high on the x-axis on the left, and the residual, smaller eigenvalue factors to the right. In essence, the scree plot should have a distinct 'elbow' on the graph that assists investigators in determining which factor captures the most information contained in the individual items. Both of these methods, as well as an analysis of the factor loadings on the component matrices are used in the analysis below.

Technology use. Each of the five items measuring participants' daily use of technology (cell phone, texting, email, instant messaging, and social networking) were loaded into the SPSS software and analyzed to better understand if a factor(s) could capture responses. The scale of responses for each of the questions was from 0 hours to 10 (or more) hours per day. Five factors were initially extracted in an effort to better understand which, if any, factors could describe the information in the technology use items. Based on the techniques discussed above, a factor analysis conducted using SPSS software yielded a factor that encompassed technology use. The eigenvalue for the first factor extraction is 2.2167, and this factor accounts for slightly over 44 percent of the variance of the instrument items. The other four factors extracted from the data fall below the recommendation to retain eigenvalues of 1.0 and were omitted (DeVellis, 2003). Table 8 illustrates the eigenvalue of the factors extracted from the data as well as the percent of variance explained by each factor.

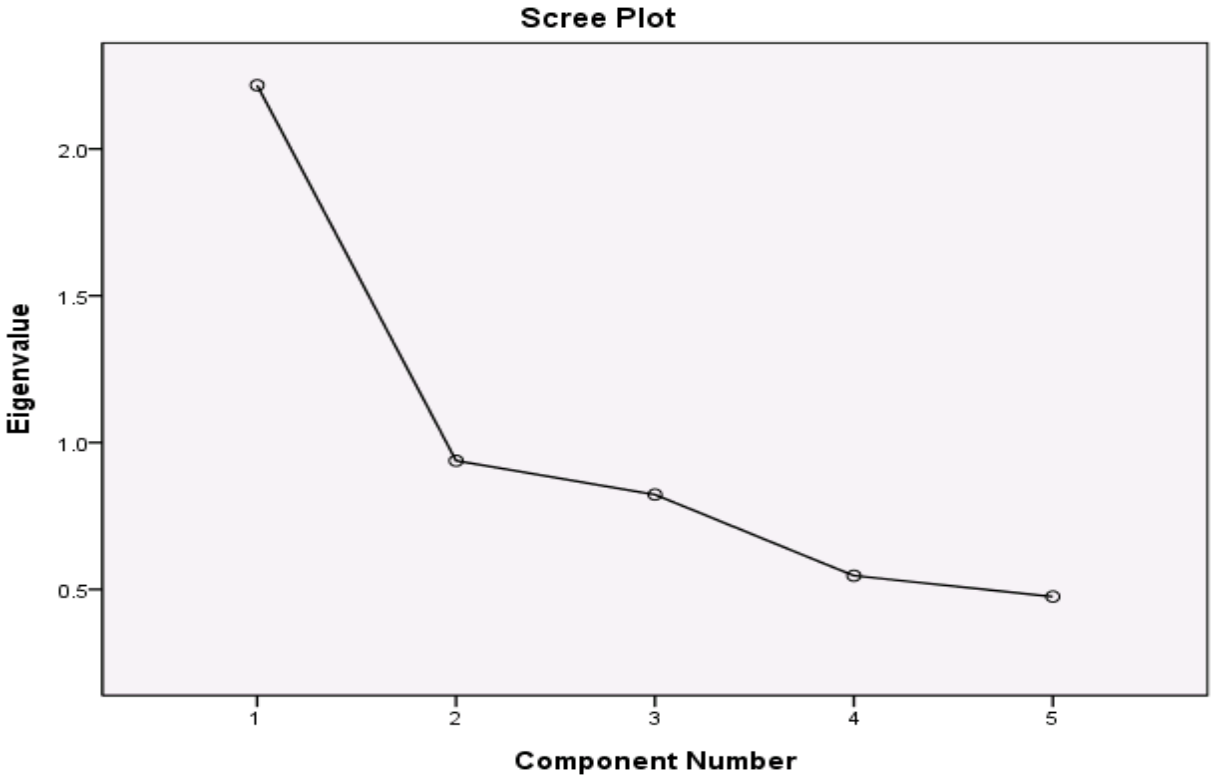
Table 8

Eigenvalues and Variance for Factor Extraction of Technology Use Variables

Factor Extracted	Eigenvalue	% of Variance	Cumulative %
1	2.217	44.341	44.341
2	.938	18.763	63.104
3	.823	16.456	79.560
4	.547	10.933	90.493
5	.475	9.507	100.000

In addition, the scree plot for the technology use factor analysis further suggests that the first extraction accounts for the majority of the variance, and that the other factors extracted do not account for as much information contained in the items related to

technology use. This graphical representation supports the decision to retain the first extraction as the overall technology use factor (DeVellis, 2003).



When examining the component matrix and the individual item loadings on the overall factors, several noteworthy results emerge. First, each of the items measuring use of the technology media are positively associated with component extraction one. Instant messaging and cell phone use load the lowest on the first factor (.51 and .53, respectively) whereas the other media each score above .7 on the first factor extraction. Second, on the second extraction, only one medium of technology, instant messaging, emerged as loading highly on this factor. The other media have a correlation of less than .2 or a negative association with the factor. Finally, a similar loading is reported in the third extraction with the cell phone use item reporting to be highly correlated with the third factor (.82). The other types of technology media are negatively associated with the

third factor extraction, and thus the third factor does not capture the item responses as does the first. Hence, because these latter two have only one media strongly correlated with the component extraction, extractions two and three will be excluded, and the first will be retained. Table 9 illustrates the item loadings discussed in this section.

Table 9

Component Matrix for Technology Use Items

	Component Extracted		
	1	2	3
SNS	.774	.143	-.138
Email	.740	-.430	-.060
Text message	.729	-.367	-.188
Instant message	.507	.753	-.294
Cellphone	.531	.177	.824

In light of these analyses and for the purposes of this study, I elected to use the first extraction as a factor which accounts for the five items encompassing socially interactive technology use on the survey instrument.

Diversity Engagement. As stated in Chapter Three of this study, two sets of items borrowed from the National Study of Student Engagement (NSSE) were previously analyzed by research professionals and reported in an article of the psychometric properties of this instrument (Kuh, 2001). The first set of items is the 'diversity' in student engagement items which ask students the questions of have you: "had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values"; "had serious conversations with students of a different race or ethnicity than your own"; and "discussed ideas from your readings or classes with others outside of class?" Responses were on a 4 point scale (ranging from 'very often' to 'never'). As reported above, these three items make up a stand-alone

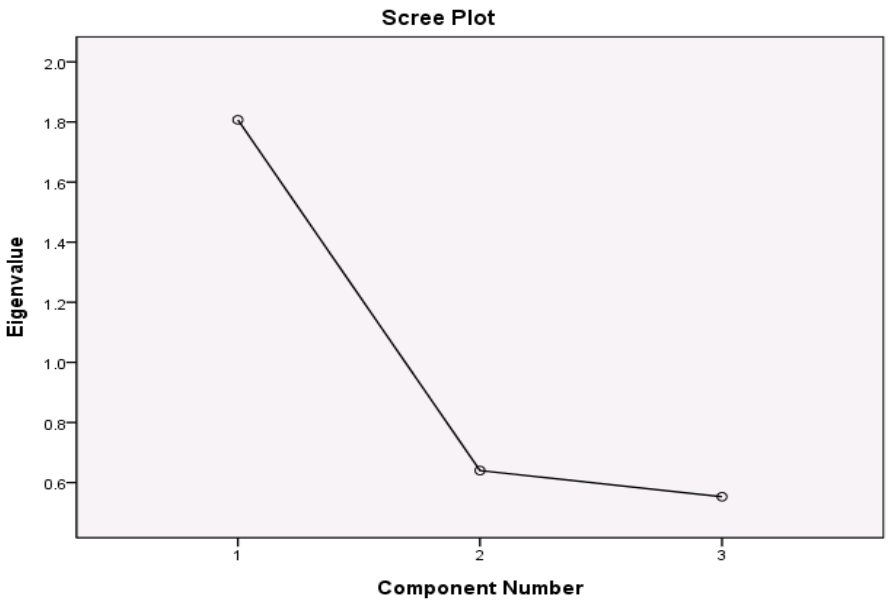
factor in the NSSE study, and were analyzed in a similar manner with the respondents in this study. Not surprisingly, using the methods discussed for the above technology use factor, these three items can be clustered into a factor based on the participant responses in my research study. The eigenvalue for the first factor extraction is just over 1.8, which accounts for over 60 percent of the variance for the 3 instrument items in this component of engagement. In addition, the scree plot demonstrates the sharp decline in eigenvalues between factor extractions one, two, and three. Both the eigenvalues and scree plots suggest retaining this factor as an overall measurement of diversity in engagement (DeVellis, 2003), and are supported by the NSSE psychometric analyses originally stated in Chapter Three of this study (Kuh, 2001).

Table 10 and the accompanying scree plot graphic illustrate the discussion of the selection of the diversity engagement factor.

Table 10

Eigenvalues and Variance for Factor Extraction Diversity Engagement Variable

Factor Extracted	Eigenvalue	% of Variance	Cumulative %
1	1.807	60.236	60.236
2	.640	21.333	81.569
3	.553	18.431	100.000



In addition to the tables above, a component matrix demonstrates how strongly the items are loaded (associated) with a particular factor. Table 11 illustrates that the three items addressing diversity are highly associated with factor one.

Table 11

Component Matrix for Diversity Engagement Variable

Item	Component	
	1	2
Conversations diff values	.803	-.027
Discussed ideas	.765	-.549
Conversations diff race	.760	.581

In light of this analysis, I elected to use the diversity engagement factor as a means of condensing and capturing the items included in this section. Note that these

findings echo those of the original psychometric analyses completed by NSSE (Kuh 2001).

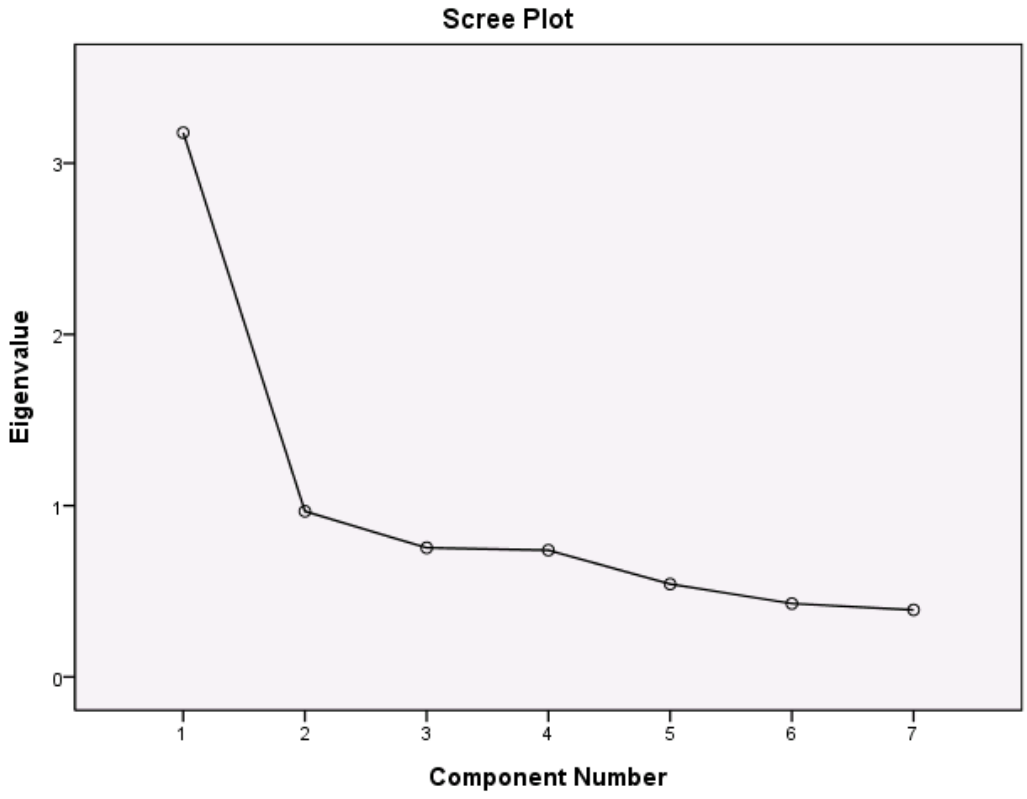
Personal-Social Growth. The second set of items borrowed from the NSSE instrument asks students to report on items related to their personal and social growth during the college experience. Items included here assess to what extent participants' experience at the institution contributes to their knowledge, skills, and personal development in areas such as: developing a personal code of values and ethics; understanding oneself; understanding people of other racial and ethnic backgrounds; contributing to the welfare of your community; solving complex real-world problems; learning effectively on your own; and voting in local, state, or national elections. These seven items cluster together to form a 'personal-social' factor and account for 41.7 percent of the variance for 'educational and personal growth' section of the original NSSE instrument (Kuh, 2001). These items make up a stand-alone factor in the NSSE study, and were analyzed with the respondents in this study. Not surprisingly, using the methods discussed for the above factors, these items can be clustered into a 'personal-social' engagement factor based on the participant responses in my research study. To support this, the eigenvalue of the first factor extraction is nearly 3.18, and accounts for over 45 percent of the variance of the items analyzed with respect to this component of engagement. In addition, the scree plot demonstrates a sharp decline in eigenvalues between factor extractions. Both the eigenvalues and scree plots suggest retaining the first extraction as an overall factor of personal-social engagement (DeVellis, 2003), and are supported by the NSSE psychometric analyses originally stated in Chapter Three of this study (Kuh, 2001).

Table 12 and the accompanying scree plot graphic illustrate the discussion of the selection of the factor for these items.

Table 12

Eigenvalues and Variance for Factor Extraction for Personal-Social Engagement

Factor Extraction	Eigenvalue	% of Variance	Cumulative %
1	3.178	45.400	45.400
2	.967	13.815	59.215
3	.754	10.768	69.983
4	.740	10.568	80.552
5	.542	7.743	88.295
6	.428	6.118	94.413
7	.391	5.587	100.000



In addition to the tables above, a component matrix demonstrates how strongly the items are loaded (associated) with a particular factor. Table 13 illustrates that the three items addressing diversity are highly associated with factor one.

Table 13

Component Matrix for Personal-Social Engagement Variable

Item	Component		
	1	2	3
Personal code	.803	.125	-.203
Solve problem	.724	.145	-.075
Understand self	.700	-.510	-.095
Understand race	.646	.288	-.121
Welfare	.630	.353	-.249
Learn on own	.626	-.634	.130
Vote	.561	.248	.778

While all of the items load on component one with scores ranging from .56 (voting) to .8 (personal code of ethics), the other two components extracted using the SPSS software do not share the similar relationship with components two and three. The item on voting in an election did load highly on factor three (.78); however this is the only item on factor three showing such a high correlation. Thus, I have selected all seven items to constitute a factor on personal-social growth.

Non-Classroom Experience. The third set of engagement items borrowed from the original NSSE student engagement instrument include a variety of questions regarding how students spend time in campus activities, and how they have reflected on their own views and perspectives, as well as those of others. Items included in this section ask participants during the current school year the frequency with which they

have: "attended an art exhibit, play, dance, music, theater, or other performance"; "exercised or participated in physical fitness activities"; "participated in activities to enhance spirituality such as worship, mediation, or prayer"; "examined the strengths and weaknesses of your own views on a topic or issue"; "tried to better understand someone else's views by imagining how an issue looks from his or her perspective"; and "learned something that changed the way you understand an issue or concept". As stated in Chapter Three above, these items were not categorized into an existing factor as reported by the NSSE psychometric properties analysis. Thus, in an effort to understand how these items relate to one another, as well as to ascertain if a latent variable could best capture the essence of the responses, I used SPSS to conduct a factor analysis (based on similar procedures discussed with the above variables) in an effort to condense these items into a smaller factor.

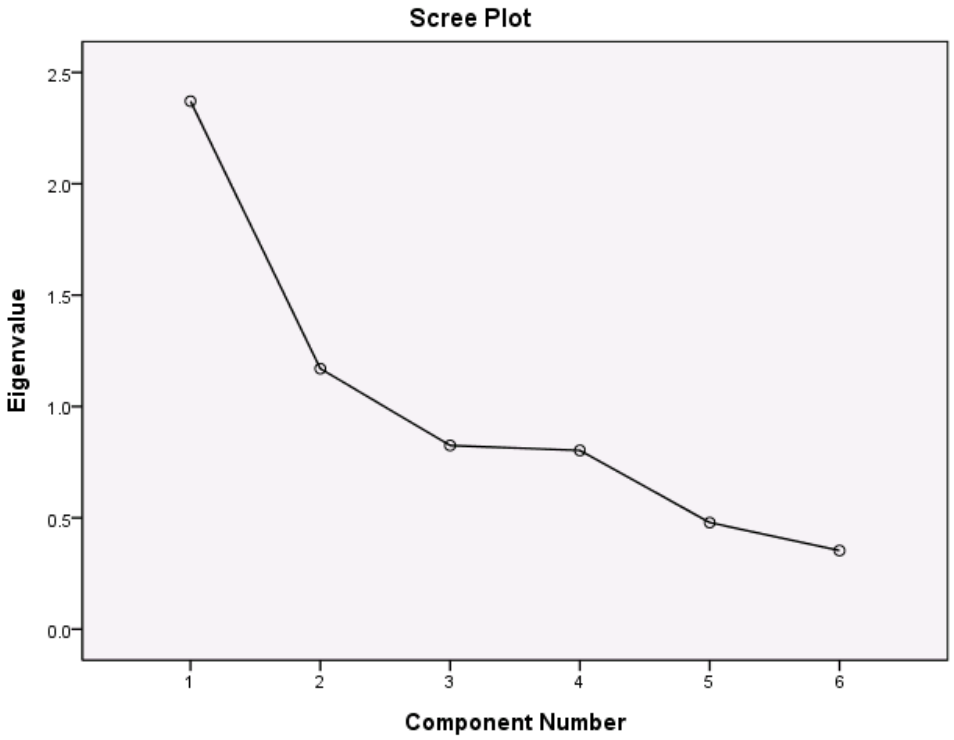
When compared to the factor analyses completed for the items above, these six items yielded mixed, yet interesting results. When examining the eigenvalues of the items after a component extraction, two factors emerged with scores over 1.0. The remaining extractions demonstrated values of less than one. Again, according to DeVellis (2003) factors with eigenvalues greater than one capture more information than the stand alone individual items. In addition, the first two factors combined account for nearly 60 percent of the total variance. Table 14 illustrates these results.

Table 14

Eigenvalues and Variance for Factor Extraction for Non-Classroom Experience Variable

Factor Extraction	Eigenvalue	% of Variance	Cumulative %
1	2.371	39.516	39.516
2	1.170	19.501	59.016
3	.825	13.747	72.764
4	.803	13.376	86.139
5	.479	7.979	94.119
6	.353	5.881	100.000

When illustrated graphically, the scree plot for the above eigenvalues do not demonstrate a sharp 'elbow' (DeVellis, 2003) as previously demonstrated and discussed in the factor analyses above.



Because the eigenvalues of the responses in this set of variables suggest that two factors may be extracted, I performed a verimax rotation (via SPSS software) of the data to better understand and investigate the possible underlying latent variables which could explain these data. DeVellis (2003) describes factor rotation as a way of presenting data in a factor analysis in a way that is easier to understand. In essence, rotation is a means to assist in identifying how items correlate with a certain latent variable (or factor). "Factor rotation increases interpretability by identifying clusters of variables that can be characterized predominantly in terms of a single latent variable, that is, items that are similar in that they all have a strong association with only one and the same factor" (p. 116). Stated simply, factor rotation does not change the items but emphasizes the relationships among them by using different perspectives on viewing data, or by providing a 'vantage point' from which to describe them.

Following the verimax rotation, a component matrix of the rotated solution illustrates that there are two possible underlying factors or latent variables capturing the responses. Factor one has three items that clearly load heavily, which include: trying to understand someone else's views from their perspective; examining the strengths and weaknesses of one's own views on a topic; and learning something that changed the way you understand an issue or concept. Each of these items is correlated with the first factor extraction at the .8 level or higher, and is not strongly correlated with extraction two. Conversely, the other three items in this section of the instrument are strongly correlated with extraction two and include respondents reporting the frequency of: exercise or physical fitness activity; participation in activities to enhance spirituality; and attendance at art exhibits, plays, dance, music, theater, or other performance. These items are

correlated with extraction two at the .65 level or higher, and are not highly correlated with extraction one. Thus, it appears that the first set of items is captured by one factor, and the remaining items are captured by a second factor. Table 15 illustrates and summarizes this phenomenon.

Table 15

Rotated Component Matrix for Non-Classroom Engagement

Rotated Component Matrix

Item	Component	
	1	2
Understand perspectives	.865	.141
Examine strength/weak	.838	.032
Learn and change view	.800	.186
Exercise	.031	.713
Spiritual activities	.102	.656
Attend art or play	.152	.650

Intuitively, the fact that three items load highly on one factor and the remaining three on another is not surprising given the nature of items. The first three investigate respondents' meta-cognitive abilities (trying to understand someone else's views from their perspective; examining the strengths and weaknesses of one's own views on a topic; and learning something that changed the way you understand an issue or concept) and the second set of three variables loading highly on extraction two involve student participation activities (exercise or physical fitness activity; participation in activities to enhance spirituality; and attendance at art exhibits, plays, dance, music, theater, or other performance). Thus, there are two latent variables (or factors) which capture the different

clusters of responses within this one section of student engagement. In light of this analysis and discussion, two factors can be created which explain 'cognitive activities' and 'participation activities' in student engagement.

For the purposes of this study and the nature of my research question, the first factor regarding cognitive activities will be omitted from this study. As stated in Chapter One, the purpose of this study is to investigate students' social interaction and out of classroom activity. In my opinion, the factor of responses capturing students' cognitive or reflective abilities does not address the nature of my research question, whereas the second set of three responses regarding campus activities and their choices of participation is more in line with my inquiry. This is not to state that meta-cognitive activities may or may not have a relationship with technology use, but simply that these responses may be more in line with pedagogical learning, as opposed to learning outside of the classroom. The three-item factor that I consider to be participatory engagement (meaning a choice of participation is made) will be included in the regression analysis discussed below.

Miscellaneous Student Activities. The final set of engagement items borrowed from the original NSSE student engagement instrument include a variety of questions regarding how students spend time in activities that are not related to the academic experience, or involve out-of-class time commitments. Items in this section ask students to report the number of hours in a typical week that involve: preparing for class; working for pay on campus; working for pay off campus; participating in co-curricular activities (organizations, campus publications, student government, intercollegiate or intramural sports, etc.); relaxing and socializing (watching TV, partying, etc.); providing care for

dependants living with you; and commuting to class. As stated in Chapter Three above, these items were not categorized into an existing factor as reported by the NSSE psychometric properties analysis. Thus, in an effort to understand how these items relate to one another, as well as to ascertain if a latent variable could best capture the essence of the responses, I used SPSS to conduct a factor analysis (based on similar procedures discussed with the above variables) to condense these items into a smaller factor.

As with the proceeding engagement variable, the analysis and interpretation of the responses yielded results that do not demonstrate one clear underlying factor which explains the responses. When examining the eigenvalues of components (factors) extracted, the first three have values greater than 1.0, and the fourth is a close .98. This suggests that several underlying latent variables may exist which capture the responses of participants (DeVellis, 2003). In addition the scree plots of these data do not demonstrate a sharp 'elbow' (DeVellis, 2003), thus making it difficult to hone in on a particular factor or factors to explain these phenomena. Table 16 and the subsequent scree plot illustrate this analysis and discussion.

Table 16

Eigenvalues and Variance for Factor Extraction for Misc Student Activities Variable

Factor Extraction	Total	% of Variance	Cumulative %
1	1.363	19.465	19.465
2	1.227	17.529	36.994
3	1.210	17.283	54.277
4	.977	13.959	68.236
5	.870	12.432	80.668
6	.722	10.318	90.986
7	.631	9.014	100.000

Analyzing the component (factor) matrix allowed me to understand how individual items correlate with the factor extractions. Table 17 illustrates how the seven items relate to the first three factors extracted.

Table 17

Component Matrix for Misc Activities Variable

Item	Component		
	1	2	3
Relax	.689	.110	.446
Commute	.596	.100	-.045
Prepare for class	-.451	-.018	.093
Dependent care	.161	.815	-.038
Co Curricular	-.380	.722	-.150
Job off campus	.088	-.137	-.815
Job on campus	-.390	-.029	.558

In reviewing this table, it can be seen that time spent relaxing and commuting load heavily on factor one, and time spent caring for dependents and participating in co-curricular activities load heavily on number two. Two items relating to preparing for class and working off campus do not appear to have strong positive correlations to any of the three extractions.

Because the items relating to preparing for class and working for pay off campus are not strongly correlated (or negatively correlated) with any of the first three factor extractions, the data were rotated while omitting these two items from the analysis. In addition, as discussed above, I employed the verimax factor rotation in an effort to better understand the responses and to investigate any underlying factors explaining the relationship between responses and the factor extractions. Table 18 illustrates these results.

Table18

Rotated Matrix for Misc Activities Variable

Item	Component		
	1	2	3
Relax	.777	-.038	.032
Commute	.693	.032	-.117
Dependent care	.294	.791	.017
Co Curricular	-.315	.774	-.024
Job on Campus	-.070	-.003	.992

In reviewing the above table, two factors emerge with only two items loading on each one. Time spent relaxing and commuting (factor one, .78 and .69, respectively), and time dedicated to caring for dependants and co-curricular activities (factor two, .79 and .77 respectively). Note that working for pay on campus was not strongly correlated with either of these first factors, and was correlated only with factor three (.99).

In light of this, it is important to decide and justify how many items can constitute a single factor. Hatcher (1994) writes that three items should be the minimal number of items that make up a factor. Often when developing a scale, researchers seek to have 10 to 20 items make up a single factor. Hatcher (1994) also states that only if the overall instrument is short (in this case, 28 items total, excluding demographics and an open ended question) factors should consist of three items. This is the lower bound limit. In light of this, because the loadings of the items in the miscellaneous student activities variable as analyzed and discussed above, these items were not included in my factor and regression analysis.

To summarize this section, using the guidelines discussed by DeVellis (2004), several factors emerge from the data that capture their respective items and condense

items into smaller variables. First, the items asking students to respond to their use of the five social media can be condensed into a single technology factor. In addition, the items on diversity engagement and personal-social growth cluster to form two dependent variables (factors) which will be used in the regression analysis (below). This analysis echoed the original factor analysis conducted by the researchers at NSSE (Kuh, 2001). The six non-classroom engagement items were separated into two factors, one of which was strictly participation-based, and the other included meta-cognitive processes (excluded). A factor analysis on the last set of items addressing a participant's miscellaneous activities did not demonstrate that more than two items aligned with a given factor extraction. For the reasons stated in the above discussion, the factor of meta-cognitive processes and items inquiring about miscellaneous student activities will be excluded from the regression analysis discussed below.

Regression Analysis

As Newman (1994) writes, a regression analysis allows an investigator to determine how a set of independent variables explain variability in a dependent variable. Regression allows a prediction to be made regarding dependent variable scores on the basis of information about an independent variable or variables. In addition, regression results measure the direction and size of the effect of independent variables on the dependent. For the purposes of this study, the independent variables are the demographics of the participants (self-reported gender, college of study, ethnicity, and place of residence) and the technology use factor (daily time on e-mail, text messaging, instant messaging, social networking sites, and cellular phone) discussed above. The

dependent variables consist of the engagement factors retained in the above section (personal-social growth, diversity, and participation activities).

Statistical significance (alpha) is a way of stating that the data suggest that a relationship exists within a sample that accurately reflects the population. In addition, a significant relationship means that relationship is not due to chance, for a given percent of time (Newman, 1994). The Alpha value was set at .05, so that that results greater than .05 will not be statistically significant, and that those less than (or equal to) .05 will suggest that a significant relationship exists. Put simply, a significant relationship in this study means that with a degree of ninety-five percent confidence, a relationship does exist between the independent and dependent variable(s) that is not due to chance. Each of the three engagement factors are discussed in relationship to the independent variables in the remainder of this section.

Engagement: Personal-Social Growth. Recall that this factor consists of seven items including the extent to which participants' experience contributes to their knowledge, skills, and personal development in areas such as: developing a personal code of values and ethics; understanding oneself; understanding people of other racial and ethnic backgrounds; contributing to the welfare of your community; solving complex real-world problems; learning effectively on your own; and voting in local, state, or national elections. When controlling for demographic information as well as the technology use of the participants, a statistically significant relationship does not exist as evidenced by the model summary, $F = .596$, sig $p = .758$, $R^2 = .029$, Adj $R^2 = -.019$. Table 19 illustrates the results of this analysis. Note that the technology factor (factortech) is included in model 2.

Table 19

Regression Analysis for Demographic and Technology Use Predicting Engagement: Personal-Social

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	2.847	.213		13.391	.000
	Sex	-.174	.094	-.158	-1.845	.067
	Residence	-.036	.102	-.030	-.351	.726
	Ethnicity	-.038	.126	-.025	-.299	.765
	Arts and science	.106	.197	.095	.539	.590
	Business	.167	.214	.125	.777	.439
	Education	.117	.241	.062	.484	.629
2	(Constant)	2.885	.228		12.646	.000
	Sex	-.180	.095	-.163	-1.886	.061
	Residence	-.038	.103	-.032	-.374	.709
	Ethnicity	-.019	.132	-.013	-.147	.883
	Arts and science	.105	.197	.094	.534	.594
	Business	.163	.215	.122	.759	.449
	Education	.111	.242	.059	.459	.647
	Factortech	-.023	.049	-.041	-.466	.642

a. Dependent Variable: personal_social

Engagement: Diversity. When examining the predictive relationship between demographic characteristics and technology use on a participants' engagement in understanding diversity (a three item factor, as discussed above), a statistically significant relationship was found. Again, the items in this factor ask respondents the questions of have you: "had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values"; "had serious conversations with students of a different race or ethnicity than your own"; and "discussed ideas from your readings or classes with others outside of class?" The model

summary for the relationship between the two variables shows significance, F= 2.78, sig p = .01, R^2 = .120, Adj. R^2 = .083. Specifically it suggests that when controlling for all demographic variables as well as use of technology, a participant's ethnicity is the only statistically significant predictor of this factor of engagement (alpha = .05, sig = .001). Simply stated, a student who identified as being of an AHANA background scored significantly higher on the factor of diversity. More specifically, students reporting an AHANA background have scores increasing by .515 (beta) on the dependent variable (diversity factor). Table 20 illustrates the results of this regression analysis.

Table 20

Regression Analysis for Demographics and Technology Use Predicting Engagement: Diversity

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.913	.252		11.579	.000
	Sex	.144	.112	.105	1.294	.198
	Residence	-.159	.121	-.105	-1.316	.190
	Ethnicity	.522	.148	.281	3.514	.001
	Arts and science	-.103	.233	-.074	-.441	.660
	Business	-.226	.254	-.136	-.891	.374
	Education	-.161	.285	-.069	-.563	.574
2	(Constant)	2.899	.270		10.734	.000
	Sex	.146	.113	.107	1.297	.197
	Residence	-.158	.121	-.105	-1.302	.195
	Ethnicity	.515	.156	.278	3.305	.001
	Arts and science	-.102	.233	-.074	-.439	.662
	Business	-.225	.255	-.135	-.883	.379
	Education	-.159	.286	-.068	-.553	.581
	Factortech	.008	.058	.012	.141	.888

a. Dependent Variable: diversity

Engagement: Participation Activities. Items in this factor ask students about attendance at an art exhibit, play, dance, music, theater, or other performance; exercise or participation in physical fitness activities; and participation in activities to enhance spirituality such as worship, mediation, or prayer.

When controlling for all the demographic data as well as the technology use factor, a statistically significant relationship does not exist as supported by the model summary, $F = .397$, sig $p = .903$, $R^2 = .138$, Adj. $R^2 = -.029$. Thus, the independent variables are not a significant predictor of a student's engagement in this three item factor. Table 21 illustrates the regression analysis for the factor capturing the participation activities scores of the research participants.

Table 21

Regression Analysis for Demographic and Technology Use Predicting Engagement: Participation Activities

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.443	.242		10.083	.000
	Sex	-.047	.107	-.038	-.439	.662
	Residence	.048	.116	.035	.409	.683
	Ethnicity	-.115	.143	-.068	-.807	.421
	Arts and science	.228	.224	.180	1.020	.309
	Business	.251	.244	.166	1.027	.306
	Education	.140	.275	.066	.508	.612
2	(Constant)	2.512	.260		9.677	.000
	Sex	-.058	.109	-.046	-.535	.593
	Residence	.043	.117	.031	.369	.713
	Ethnicity	-.082	.150	-.049	-.548	.585
	Arts and science	.227	.224	.179	1.012	.313
	Business	.245	.245	.162	1.000	.319
	Education	.129	.275	.061	.469	.640
	Factortech	-.042	.056	-.067	-.753	.452

a. Dependent Variable: participation_activity

In reviewing the regression analyses in this section, only one of the three models presented a statistically significant relationship between the independent variables and an engagement factor. Specifically, this finding was that a relationship exists among students reporting to be of an AHANA background and the understanding diversity engagement factor, when controlling for all other independent variables. A rationale for the regression findings will be discussed in Chapter Five.

Having concluded an analysis on the quantitative data collected for this research project, the results will now turn to an analysis and discussion of the qualitative data obtained from respondents from the open-ended question included on the instrument.

Qualitative Analysis

As stated in Chapter Three, one open-ended question was added at the end of the survey instrument. The question was essentially the dissertation research question posed in a way that student respondents could understand: "In what way(s) do you feel the technology devices mentioned in this study either help or hinder your experience as a college student?"

This section will summarize and illustrate the qualitative data as a means of describing the perspectives, opinions, and experiences of the participants. Data were coded by using a method suggested by Foss and Waters (2003), who advocate a multi-step process when analyzing and summarizing qualitative data. First, responses were separated into individual statements, and each response was assigned a phrase or heading that captured the nature of the response. Second, the coded responses were placed into categories that shared the same label or were closely related to one another and incorporated the overall conceptual nature of the responses. Upon completing this, codes were reviewed to ensure that the individual responses were related to one another and conceptually addressed and supported the larger, generalized category. This process is similar in nature to open and axial coding as discussed by Neuman (1994). Open coding is performed by a research in the 'first pass' through the recently collected data in an effort to condense statements or responses into categories. While reviewing the data, I assigned a label or code to each of the statements in an effort to bring themes to the

surface from within the data. In axial coding, the focus moves from the data themselves to the codes assigned to each response. The codes are divided into categories and groups of responses that cluster together. I then organized responses into a series of themes that sought to support and answer the research question. Finally, themes were organized in a format for appropriate presentation to readers, as discussed and illustrated below. Given the nature of the question, this section will first discuss and illustrate how students perceive socially interactive technology as a help or benefit during their college experience, followed by the themes that emerged as hindrances. This section concludes with a summary of the qualitative data presented, as well as its relevance to the quantitative survey data.

To begin, the major theme that emerged from the participants as a benefit to campus life is that socially interactive technology allows for enhanced, efficient, and prompt communication with peers. This was by far the most frequently reported positive benefit of social media. Simply stated, SITs "help because they enable fast and easy communication with other students" and also SITs "Help me find out quickly where or what a friend is doing." The benefit of this communication was most commonly described as participants sensing a greater 'connection' with other peers, which was facilitated by a variety of SITs examined in this study. For example, one student reported that e-mail "Kept me in contact with my friends" and another simply stated that e-mail also "help(s) me stay connected and find out whats (sic) going (on)." In addition, while comments regarding use of text messaging were not as common among participants as other SITs, students did note this medium assists in maintaining connection because "text messages keep me connected to my friends and classmates. It helps with collaboration

and planning study and social events," and further "I hardly ever talk on the phone, but would be lost without texting." Several students in the study also commented that given time constraints, socially interactive technology enables them to connect and interact with one another on a timely basis. For example, "Facebook helps me connect with friends even when I'm too busy to actually see them" and also "tech devices help me stay in touch because I'm on the go a lot." Finally, Facebook, a Social Networking Site (SNS), was the most frequently cited media for maintaining connection with peers. As one student aptly stated, I "get to know people better through Facebook." Comments regarding the frequency of use of Facebook and other SNSs will be discussed throughout this section.

A second theme emerging from the data is how socially interactive technology benefits students in terms of their involvement in campus activities. Specifically, SITs advertise campus events or other social opportunities that may lead to further student involvement. Facebook in particular seems to provide a benefit in this regard. "Facebook events provide great opportunities for various activities to be publicized. All of them help – keeping in contact with peers, professors, and/or people that can help with my academic and professional development." While other students echoed this sentiment, one student expanded it to other SITs by stating "texting, talking on a cell phone, and social networking sites have kept me more in touch with what is going on around the school." Further, SITs "are great for social networking and promoting events that benefit good causes on campus." Even though one student noted that social technologies can be a hindrance because they can be distractions, he/she admitted that they "help integrate the campus community socially, a little, and not much else." Given

the research on student participation in campus events (i.e. Astin, 1993) and impact on student development, the ease by which socially interactive technology advertises and markets a diversity of campus events may in turn provide opportunities for increased involvement. The role of technology enhancing campus events is exemplified in this student response: "I don't know how people socialized without texting or going on Facebook. Most events I go to are organized through Facebook, including academic events."

While not a focus of the study, another theme is the opportunities SITs provide for enhanced learning. The majority of responses in this category support this notion in one of two ways. First, students reported that technology assists in communication with faculty and professors of their courses. Email was the most common form of communication between students and faculty members. Students summarized this perspective with comments such as: "Email makes it easy to quickly and efficiently communicate with professors" and "email helps my experience because it is a precise and timely manner in which to communicate with other students or faculty members regarding course information." Interestingly, students only reported using e-mail with faculty, as opposed to social networking sites, cell phones, or texting. The second aspect of enhanced student learning is that students use a variety of technologies to ask academic questions of their peers. Text messaging was commonly reported as a means to communicate academic information. One student noted, "texting can help me arrange meetings with fellow students or to ask quick homework questions" while another reported "text messaging however, has kept me in touch with classmates and has saved me from forgetting assignments that may be due that day." In addition, "cell phones/text

messaging is an effective way to communicate to others in a class if you have a question." In addition to texting, several students commented that social technology in general enhanced their education. For example, one participant commented that "They allow me to connect with other students on campus and in my classes more readily which is definitely helpful…" Interestingly, only two students noted that they use Facebook or other social networking sites for academic purposes. The majority of times Facebook was mentioned either as a way to keep in touch for social events and communication or as a distraction to class work (as discussed below). Thus, it appears that Facebook is more of a social tool than an academic one. To summarize this theme, one student reported "Whether it is for class, research, communication, or social networking, technology only enhances education."

A final theme of technology being 'helpful' in the college experience is that technology, more specifically SNS, allow students to stay in touch with friends who do not attend the host institution. One student noted that technology "help(s) keep in touch with friends, especially those not at this university." Another echoed that social interactive technology helps with "keeping in touch with friends and family at home." Using Facebook, one participant noted that it "has especially kept me in the loop with friends…(and) has also been great in helping me stay in touch with friends around the country." Finally, one student considered him/herself as being 'technology dependent' because he/she was involved in a long distance relationship. While the majority of responses to the question illustrate how technology allows students to connect with one another at the host institution, these responses suggest that technology reduces communication barriers with those from home or who attend other institutions.

While the themes noted above illustrate how students perceive socially interactive technology as a benefit during their time as an undergraduate, certain themes also emerged in the responses that illustrate hindrances or detriments to the college experience. The remainder of this section will discuss the 'hindering' themes that emerged from the qualitative data.

First, responses support the theme that socially interactive technology may be an academic and classroom distraction for participants in this study. While the academic experience of students is not the primary focus of this study, the responses in this category are frequent and strong enough to warrant their inclusion in this report. Distractions from academic work generally fell into one of two categories – distractions while physically attending class, and procrastination from studying outside of class. To illustrate the first of these, students reported that SITs kept them from paying full attention to the professor while attending class, or participation in discussion. For example, one student noted that he/she is "more attentive to my phone than the class I am in." With the prevalence of laptop computers and wireless connections in classrooms, students today have the opportunity to use them in class, however, several report this as a distraction. For example "Facebook may be a hindrance because it is distracting – I see many students surfing FB on their laptops during class." Although these examples demonstrate that phones and computers are distractions during class, another extends the opportunity for distractions to more SITs by stating "I think they hinder the learning experience more than the students realize because in class students tend to pay attention more to various media devices instead of the teacher." Regardless of the media, given

the popularity of technology devices, and their portability, they may pose a distraction in the academic classroom.

Following the theme of technology interfering with the academic experience, students not only reported that SITs can prove distracting in the classroom, but perhaps to a greater degree, distracting when dedicating time to studying and focusing on other activities. This was perhaps the most frequently cited hindrance of technology to the participants' experience in college. For example: "For the most part the technology mentioned hinder my studies because they provide me with distractions." While stating that technology makes forms of communication easier, one participant warns "they can also be a distraction and an easy way to procrastinate." While students generally reported SITs to be 'distracting', an 'interference with schoolwork' or a means of 'procrastinating' during times otherwise dedicated to studying, one student notes that technology distracts from other activities as well. He/she specifically commented on using a Blackberry (a cellular phone with Internet capability) and stated "after I got a Blackberry, I started to hate it. Everyone is always BBMing (Blackberry's Instant Message program) me, I receive my Facebook and e-mail messages on it, and I feel like EVERYONE expects an IMMEDIATE response, which completely distracts me from what I'm doing when I received the e-mail/text/BBM Facebook message." This participant concludes that "technology has been a hindrance because it distracts me from doing my work and even focusing on conversations sometimes."

Continuing within the theme of academic distractions, Facebook (or other SNS) was reported to be the most common social medium that poses distractions from completing academic work outside the classroom. To begin, a participant in the study

stated “Social networking sites hinder my experience because it is very easy to lose a couple of hours just looking at other peoples (sic) pictures, etc., which means less time spent doing productive work that needs to be done.” Specific to Facebook, one student reported “Without Facebook, we would perhaps work an hour or two, and then take a longer solid break, and then return to work. With Facebook and chat, we work fifteen minutes, check Facebook for three, and then repeat.” This statement not only suggests that Facebook can be a distraction, but also speaks to the ease in which students can log on and off of SITs, and that updates and communication can occur over brief periods of time. In an effort to alleviate the distractions associated with SITs, one student reported that he/she needed to take a proactive step to avoid losing productive time. “Facebook hinders my ability to be productive. I disconnect with Internet when I have to get a serious amount of work done.” Another student reports a level of awareness in terms of distraction by writing “Facebook serves as a good avenue for procrastination, which can occasionally hinder my studying, but only as much as I allow it to.” It is interesting to note that students readily describe socially interactive technologies as a common distraction during academic pursuits. Thus it appears that there is a high degree of self-awareness of their own use of these technologies, and participants also report taking measures to prevent technology from impeding their studies.

In addition to these hindrances, students commented about the quantity of e-mail received on a regular basis. One participant reported that “often times I am informed about things that interest me, yet sometimes there are just too many of them that I overlook a lot of the important ones.” Another noted that “Email is both a help and a hindrance, as it is definitely the most convenient way to communicate, but its (sic) very

easy to get bogged down in it or miss important notifications." Another reported "Email is a huge help but sometime overly time consuming." One student took this statement a step further and stated that "email adds stress to my day as I try to respond and deal with the volume of it" and another reported "email is taking over my life." Thus, although the ease and connective qualities of e-mail are apparent, it seems as though this comes at the cost of sheer quantity of messages received, and the time commitment or possible loss of important messages. In addition to e-mail, the quantity of communication may extend to other SITs as well. Another student interestingly reported that "I lost my phone this year and really appreciated the time off." From this experience he/she attempted to continue the practice of turning off the phone several times per day, but "I find that other people react very poorly." Thus, while it would appear that the quantity of communication via socially interactive technology is daunting for some students, there is also an expectation that they be up to date and accessible to others. This can be further illustrated by the response "…my constant connection makes me feel as if I am forever at the beck and call of teachers, friends, etc."

Interestingly, students widely noted the impersonal and non-intimate nature of SITs, and raised concerns over the lack of interpersonal and face to face communication. This level of communication was reported as a hindrance in participant's college experience. For example at least eight respondents specifically mentioned a decrease or concern over the notion of 'face to face' communication, and several others note a reduction in personal connection, closeness of relationships, and that SITs do not aid in social skills. Most pointedly, one student wrote "I feel people of our generation are too reliant on technology to socialize. We rely on it so much that it hinders are (sic) real-life

interactions with others…We have no problem holding conversations on our computers but can't bear the thought of talking to another individual face to face." Echoing this concern is another who said "I have semi-seriously, semi-jokingly said that texting is the ruin of our society. People are no longer able to communicate as effectively as they used to, perhaps not in large scale situations, but certainly in small scale ones." One response indicated that a student has "roommates who cannot connect or have a conversation without using the front of technology." Perhaps the most fitting summary of this theme is explained by one student who quipped "Too much time looking at a screen of any sorts dulls the brain, limits one's relationship with friends and the natural world…"

To summarize the qualitative data findings, several themes emerged following the categorizing and coding of the data. Data suggest that technology use among students in the research project has both benefits, and as well as hindrances in the college experience. Technology benefits students by increasing communication, informing students of campus activities, enhancing academic discussion and learning, and connecting with family and peers away from the host institution. Conversely, they may hinder the experience by serving as a distraction from class, from studying and other activities, being overwhelming in terms of sheer quantity, and causing a lack of face to face or personal communication. From the participants' perspective, social technology is essential for staying current with events and the whereabouts of peers, but deters from focusing on academics and interpersonal interaction.

To illustrate responses, Table 22 provides an overview of responses by demonstrating a raw count of the number of times a response that was categorized into one of these themes was reported.

Table 22

Frequency of Response to Open-Ended Question

Category of Response	Number Reported
Benefits	
Frequent and Efficient Communication	33
Information/Organization Campus Activities	14
Enhanced Learning/Academic Discussion	24
Connect with Those not Present at Host Institution	7
Hindrances	
In/During Class Distraction	9
Distraction from Study and Activities	29
(SNS or Facebook in Particular)	13
Quantity or Volume of Messages	7
Lack of Face to Face or Interpersonal Communication	18
Other	
Miscellaneous, not in Category Above	13

*Note students could report multiple responses to this question.

While the statistical data discussed above demonstrate the quantitative relationship between student use of social technology and engagement, the data presented via the qualitative responses add depth and richness to the experiences of participants in this study, and offer a unique and informed perspective. An in-depth discussion of the findings discussed here as well as implications for future research, study, and practice are discussed next in Chapter Five.

Chapter Five – Discussion

The purpose of this chapter is to discuss and review the findings of the research study, limitations, and implications for future practice and research. The chapter will begin with a review and discussion of the results outlined in Chapter Four. Results are from the descriptive statistics, regression analyses, and qualitative responses. Following this, limitations of the study will be illustrated, and the chapter will then discuss recommendations for future practice and research.

Discussion of Findings

In terms of the descriptive statistical analysis, several noteworthy discussion points emerge. Recall that the mean use of technology by students in the study was 7.78 hours per day, regardless of type of social technology (or combination of media). On an initial reading, it may seem quite alarming that students spend nearly eight hours per day using social technology. With the daily stresses of coursework, working for pay, time dedicated to co-curricular activities, and interactions with friends and family members, it seems that spending an additional eight hours per day exclusively using technology would be impossible. However, a discussion of this finding may lend perspective, and make eight hours per day seem more realistic.

As the qualitative findings bear out, students don't 'find' time in the day to supplement their daily tasks in effort to spend more time on Socially Interactive Technology (SITs). Instead, students use technology for short periods of time during the day which cumulatively add up to this amount. Students appear to engage in college activities while simultaneously using technology because of the ease, portability, and efficiency of technology devices (i.e. Junco & Mastrodicasa, 2007). For example, as the

descriptive statistics report, at least 3 percent of the participants in this study reported using text messaging 10 hours per day. It is unrealistic to assume that a handful of students text on their phones for 10 hours per day consecutively, nor do they block out ten total hours per day on their schedules to text. However, they text while in class, during campus activities, and while they would normally be studying, to name a few activities. Interestingly, students can use all five of the social media studies with at most two devices – a computer and a cell phone. Further, with the recent popularity of Smartphones (iPhone, Blackberry, etc.), users can be connected to all five media with the same single hand-held device. The study findings, in sum, could be explained by the following: students have not found new time during a 24-hour day to engage in the use of SITs, nor do they opt out of participating in engaging campus activities, but rather they have found time in their daily schedules to roll the use of technology in with their normal day-to-day activities. Therefore, students use social media while participating in traditional college activities, and thus do not lose time away from being involved, which explains how the number of hours per day using technology can be seemingly high. However, the quality of this involvement is yet to be seen and will be discussed in greater detail below.

The total number of hours participants report using social technology reveals that social networking (303), text messaging (296), and email (288) are the most heavily used media across participants, and are relatively close in time. Following these three, there is a drop in cell phone use (164) and Instant Messaging (121), with this last medium showing the lowest number of total use by far. Categorically, Instant Message was reported to be the lowest in frequency across all data analyses. The drop in use of instant

messaging could mean that students perceive other media such as text messaging to be more efficient, or that they are using other means to 'chat' with one another, such as a recent chat option developed by Facebook to be used while logged into their accounts. This allows Facebook users to identify and open a chat dialogue with other friends who are currently online in addition to updating and surfing profiles of others. Regardless of the causes, Instant Messaging appears to have lost its appeal with participants in this study.

In addition, participants reported using text messaging at a higher rate than cell phones. To students in the study, the original purpose of owning a phone for a spoken conversation with another is secondary to sending a typed text message. These data seem to speak to the popularity of sending a simple text message as opposed to calling another and engaging in conversation. One reason for this is that text messaging offers a means for short, quick communication, as opposed to a more lengthy conversation. The need for short communications can be driven in part by the qualitative responses that students are overloaded with messages and email, and this mode of communication allows them to respond in a more timely and efficient manner without the presumably lengthier mode of calling and speaking to another individual, or the risk of not finding the other party available to talk.

Differences in use of social technology between men and women pose another topic for discussion. As stated in the results, about one-third of men reported being in the lowest quartile of use across all media, as opposed to about one-fifth of their female counterparts. Thus, males in the study were more commonly found among the lowest users of social technology than females. This difference is particularly interesting when

considering that men are traditionally overrepresented in fields of study that are technology-heavy such as the hard sciences and engineering. However, that women are higher users of social technology suggests that they use social media to connect with each other for social interaction as opposed to the traditional technology devices used for data processing or other 'older' means of technological. Arguably, this fits the traditional, perhaps stereotypical, notion that females are more sociable than males and rely more heavily on social support networks. This would also suggest that social technology is viewed by students not as time spent using technology per se, but rather a means for communication and interaction with others.

While the cross tabulations revealed differences between males and females, differences were reported in terms of ethnicity as well. Based on demographic data, AHANA students report being in the higher quartiles of certain technology use than their White counterparts. One explanation for this finding is that the low numbers of AHANA participants in the sample were among the heaviest users of technology, and thus are over-represented in the sample and do not accurately reflect the population. A second rationale is that AHANA students choose to rely on technology for more social interaction than White students because it is a more comfortable means of communication. In other words, if they feel isolated from traditional interpersonal involvement because the host institution is a Predominately White Institution, AHANA students may use technology to engage in campus activities from a distance.

Nearly all of the correlations among technology media in this study were statistically significant. It seems likely that once a participant opts to use a medium of social technology, this leads to a more 'wired' lifestyle. If a selected medium is used,

this choice or preference may lead to the use of another, and so on leading to the incorporation of multiple types of social media. In essence, SITs are woven together and intertwined with one another, as well as woven into the fabric of the lives of today's college student.

Note that the only non-statistically significant finding for the correlations among technology types was the relationship between instant message and email use. This finding is particularly interesting in that both of these programs require users to be present at a computer and to physically type a message or dialogue with another user. Because the hardware is the same, and the method of sending a message is similar (typing on a keyboard), I would assume a greater degree of correlation. However, based on the discussion above, it is possible that participants turn to text messaging and other chat programs (i.e. Facebook) because they offer a more preferable way of sending brief and instant messages to peers. As noted previously, Instant Messae seems to have lost appeal among students, and is not among the current more popular trends in technology.

Two of the regression analyses yielded non-significant results: the degree of social media use was unrelated to personal-social growth, nor non-classroom campus engagement, as measured by factors consisting of multiple items on the NSSE instrument. It is probable that these analyses yielded non-statistically significant results for reasons similar to those discussed in the descriptive results above. The individual items that make up the factors in the regression analyses ask students to report on reflective and cognitive behavior, as well as active participation in a campus or community event or program. Thus, students select the activities and behaviors in which to participate. Based on the descriptive statistics and the qualitative data, many

participants dedicate a substantial portion of their time each day to social technology, and have to make time for this choice, as well as campus activities. However, the ease with which social technology is used allows students to simultaneously engage in other activities. Thus, the explanation of why high and low frequency technology users do not differ in engagement lies in how students are using social technology. In fact, students continue using social media while engaged in peer interactions and campus activities, and thus regardless of technology use, remain involved.

The statistically significant finding in the regression analysis was in the 'understanding diversity' engagement factor. An AHANA participant, even accounting for their use of technology, is more likely to be understanding of diversity. This is to say that students of color, unsurprisingly, are more likely than White students to be engaged and seek out opportunities for involvement in issues of diversity. In addition, as noted previously, this study was conducted at a Predominately White Institution. Students who identified as being White or non-AHANA are more likely to have interactions with peers who are, by sheer quantity, of a similar background, and may not seek out opportunities to explore diversity. It may be the case that AHANA participants are more open and receptive to exploring the notions and meaning of the items in this factor, and given the significance of this finding, more likely to use social technology to engage in these activities. Thus, perhaps AHANA students are more comfortable communicating in a social media environment than their White counterparts.

Students can now be connected and engaged with one another without the limitations of physical space. As noted above, a computer with an Internet connection and a phone is all one needs to stay abreast of coursework, campus activities, and the

whereabouts of friends and family. Following this, questions arise regarding traditional notions of student engagement and involvement. Is there a new type of 'involvement' by means of social media? As the notion of involvement (Astin, 1993) centers on the quality and quantity of time devoted to the college experience, should time and energy spent on the college experience be counted as involvement when it occurs via a social medium? Does involvement at today's college campus now include a technology component? In other words it appears that students are not disengaged because they are using social technology, but rather that they are engaged in different ways than previously researched or defined. Thus, this study suggests that student involvement and engagement may be facilitated not only by traditional campus events and interactions, but via social technology as well. The study results indicate that a new type of student involvement through SITs now exists as part of the college experience.

Throughout this discussion, I have inferred that students are using social media while engaged in other college activities. In other words, they are multitasking to keep up with social media communications while they are present on campus. One study from Stanford University raises concern over the notion of media multitasking. Ophir, Nass, and Wagner (2009) studied 262 students on how they used 12 different media forms including print, television, text messaging, cell phone calls, web surfing, and other applications to examine their ability to multitask when presented with stimuli from multiple media. Based on a multi tasking index developed by the research team, students were divided into high media multi-taskers and low media multi-taskers. The groups were then tested on their ability to maintain focus when presented with stimuli from other media, and their ability to switch back and forth between media. Interestingly, the

students who were considered high level users were more likely to be distracted by multiple streams of media and had greater difficulty paying attention to their immediate task, given the interruptions. In addition, they were not able to switch tasks as efficiently as the low use group. Low users on the other hand were more likely to be able to focus on a single task in the face of distractions. Ultimately, the study raises concern over participants' ability to 'media multitask' in that heavy users of multiple media performed poorly on task-switching, and had a reduced ability to filter interference from other media. Given the popularity of social technology on campuses today, and given the concerns raised regarding the effectiveness in multitasking with these media, it seems that the benefits of social technology and the concerns over their widespread use are at odds with one another. This also relates to the qualitative findings that students are distracted in class and while studying, and raises concerns about distractions in other types of involvement and interpersonal interactions.

So, should institutions of higher education be concerned about the levels of student use of social technology as they exist today, as it will presumably continue and increase in the future? On one hand students use technology to stay connected to one another, to be updated on campus activities, and converse with peers and faculty members regarding their academic experiences. However, it seems that the quality of involvement in these activities can be compromised due to the distractions that technology presents (Ophir, et al. 2009). In addition, similar to the distractions and time spent responding to the messages via SITs, the data raise concern for the future of communication among students in this generation and the quality and quantity of face to face and intimate communication. This is supported by student comments to the open-

ended question on the instrument. Despite the fact that students are aware of a lack of interpersonal communication, it would seem that the prevalence and need for electronic social communication has overtaken their desire for personal interaction. In other words, in the eyes of participants, it is more beneficial to stay up to date and current with the speed of interactive technology rather than invest the time and energy into personal or face-to-face communication. The data presented in this study suggest that arguments can be made for both perspectives about whether or not concern is warranted. It is clear that social technology for this generation of students is here to stay, so students must strike a balance and learn to streamline, or at least put parameters on, their use of technology. Thus, technology should not limit their interpersonal relationships or impede on their active participation in campus events which are linked to greater student outcomes (Astin, 1993).

Limitations

Several limitations to this study exist. First, as noted previously, the response rate of the sample was low. The final response rate after leaving the instrument in the field for two weeks was just under 16 percent, thus limiting the ability to make generalizations to the larger population of the host institution. Second, the twenty three items borrowed from the NSSE instrument came from a larger instrument intended to study engagement in areas beyond the scope of my study. While the items borrowed held true to the factor analysis done by NSSE (Kuh, 2001), the breaking up of the larger instrument could have played a role because participants did not answer the entire questionnaire, and other items and pre-determined factors were not included in this study. Third, the research was conducted at a private Catholic institution with a substantial cost of attendance. Many of

the participants come from high socio-economic backgrounds, and thus may have had greater access to expensive technology devices (i.e. own a cell phone, personal computer, etc.) than those attending other institutions. Further, they could have been exposed to technology at their previous institutions or in the home long before matriculating. This suggests that the participants were predisposed to using technology in their daily lives. Fourth, the demographic data suggest that the participants in the sample were mostly White, and of a non-AHANA background. Greater numbers of participants of color could demonstrate how AHANA students use technology and perhaps explain their preference for use of social technology. In addition, students at the host institution tend to be of a traditional nature, live on campus, and fall within the 18-22 age range. Simply stated, there are not many students from a non-traditional background, or who commute to the institution on a daily basis. These factors may have skewed the data to report higher numbers of technology use and involvement. For example, the literature suggests that living in a campus residence hall is correlated to higher levels of involvement (Astin, 1993). Continuing with demographics, the majority of participants in this study were female, and even more so in the sample than the population. A more robust sampling of males at the host institution could support or refute the discussion above on use of technology by sex. In addition, the descriptive statistics illustrate that men tend to use technology at lower levels than females. With more females participating in the sample, overall frequencies and time on technology in the results could thus be inflated. Overall, the sample of respondents did not mirror the population at large, and thus, generalizations regarding the entire host institution are difficult to support. Finally, a recent study by Kraushaar and Novak (2010) reports that students may under report their time spent on

social media while multitasking. This particular study monitored students using laptops during lectures and compared their actual use versus self-reported time spent on non-course related applications (in this case, email and instant message programs). Because students were using social media to multitask while otherwise involved in college activities (i.e. class lecture), they were not accurately recording and reporting the actual time spent on social technology. This presents a limitation for my study in that assuming participants were multitasking, their self-reported time spent on social technology may differ from their actual, cumulative time. Therefore, this example of a bias in self reported data should be taken into consideration as well.

Recommendations for Future Practice

Based on the data presented in Chapter Four, several recommendations for practice at institutions of higher education can be illustrated. Recommendations in this section are for both student affairs and academic professionals.

Students report that they turn to Social Networking Sites (SNS) such as Facebook to learn more about events on campus. While some campus organizations and student affairs offices at the host institution have begun to use Facebook (and other SNS) to advertise their services and events, this practice may soon be the most effective means for reaching a student audience. Perhaps the days of campus posters and paper postings on the campus 'quad' have passed and now students look to social technology for information regarding on campus events. Further, according to Astin (1993) many of the campus discussions, organizations, and events serve as opportunities for students to become involved in campus life, and thus create learning and developmental

opportunities. Thus, social technology can be used to promote developmental opportunities to students.

Although this study did not explore the use of technology and the role of faculty members, many of the respondents commented that socially interactive technology benefits them academically by allowing them to quickly communicate with classmates regarding assignments, and faculty members regarding class material. While the engagement and involvement in the college experience variables in this study focused almost exclusively on the out of class experience, faculty members may consider adapting some of the technology mentioned in this study to communicate with students (i.e. Martin, 2006). In essence, faculty could 'meet students where they are' and make efforts to communicate with students using the media discussed in this study. An example of this may be to create a Facebook page dedicated to a course topic or campus issue where students could post their opinions or rationale for their stance on a given issue. As an administrator and doctoral candidate on a college campus, I would hesitate to reveal personal information (i.e. make my cell phone number public), but would find value in appropriately recruiting student input on campus issues.

As discussed in the results of the qualitative data, participants in the study claim to be using SITs during class time and time devoted to study. In addition, students claim that SITs assist them in the learning process by providing a means for discussion about academic topics and coursework. While this was not a focus of this study, the data suggest that students use social technology to support their academic endeavors. In classrooms today, it is not uncommon to see students using laptops during lectures with cell phones present as well. Given that social technology provides a fast and easy means

for communication (Bryant, Sander-Jackson, & Smallwood, 2006), and that they are permitted in academic settings, perhaps faculty and academic administrators should be cognizant of the level of engagement students have while in the classroom. Students readily reported in the qualitative data that social technology presents as a significant distraction, and often during a class. This echoes the concerns raised by Ophir et al. (2009). A question for future academic practice would be: how are students limited in their use or possession of technology devices during the time they are to be present in a classroom? While many students today use laptops to take notes or follow course materials at their seat, they can also use multiple social media applications at the same time to interact with friends or family members outside of their physical surroundings. This may result in levels of decreased involvement and participation in class discussion and a lower quality of academic engagement. Perhaps the compromise would be to have exam rooms or classrooms with Internet technology 'blackout' times where wireless signals are prevented from reaching computers and cellular phones. This would allow students to take notes and use class applications on their laptops, but not have access to social media during class sessions.

Recommendations for Future Research

In reviewing the literature as well as the findings of this dissertation study, several topics for future research come to light. Topics discussed in this section include studying how technology impacts certain aspects of the academic experience, replicating this study at institutions of differing type and control, multitasking, the pace of evolution of social technology, and student development literature.

As mentioned above in the implication for practice discussion, this study focused almost exclusively on the out-of-classroom experience. While a wealth of literature has been written on using technology as a pedagogical tool in the classroom (i.e. Trees & Jackson, 2007), further study on how students and faculty relate to one another via socially interactive technology may be fruitful in terms of bettering this relationship. A qualitative theme that emerged from the open-ended question was that students communicate via social technology with other students and faculty to discuss course-related topics, thus supporting the use of technology to enhance the academic experience.

A similar study could also be replicated at a variety of institutions and comparisons and contrasts of technology use can be studied. For example, do students on residential campuses use SITs more or less than those on commuter campuses? What would these findings mean for student engagement and involvement at these institutions? A wealth of comparisons and contrasts exist to better understand the reasons for student use of SITs at a range of institutional types in higher education.

In addition, this study could also be replicated for a graduate student population. As noted in the limitations section above, the participants at the host institution are traditional undergraduates. As graduate students are generally older, and perhaps identify themselves as members of an older generation, it may be interesting to see how older student populations use socially interactive technologies. Further, it may also be worthwhile to see if there is a generational clash of sorts between older, non-traditional students and those that are considered more traditional and in younger generations.

A future study examining how students respond to the quantity and immediacy of messages may illustrate an additional implication for social media research. Examples of

this include the qualitative responses of “I don't know how much I appreciate the constant connectivity to my education in that my day is always subject to change at the drop of a hat and my constant connection makes me feel as if I am forever at the beck and call of teachers, friends, etc.” and “i (sic)feel like EVERYONE expects an IMMEDIATE response, which completely distracts me from what i'm doing when i receive the e-mail/text/BBM/Facebook message(s).” Studies within this theme could examine how students perceive the source or content of the messages in terms of response time. Given the immediacy and demands for prompt responses as stated within the qualitative data, how do students rank which messages are most important? In other words, does the perceived social hierarchy of a sender, or the nature of the message content, facilitate a quicker response? While Lipscom, Totten, Cook, and Lesch (2007) suggest that a form of cell phone etiquette exists among users, future studies may reveal which messages students perceive to be the most worthy of immediate response across all media types. In addition, the content of messages sent via social media could be illustrated, as well as the perceived demand for immediate response.

Should studies similar to that of NSSE include measures of a student’s use of technology? Can a new form of engagement be defined that encompasses electronic social engagement? Traditional notions of involvement and engagement were discussed and researched in this study, such as time spent discussing ideas with peers, finding campus activities, having discussions with those of a different background, etc. These can now all be accomplished by the use of technology and in the absence of face to face interactions. Social technology as it exists today was not a consideration when the

original notions of student involvement and engagement were initially researched and developed.

As introduced above, a question for the future concerns the quality of student engagement while using social media. That is, assuming that these new media can be considered a form of involvement, or at a minimum aid in enhancing student involvement. The instrument and items borrowed for this study from the NSSE ask students to report the degree to which they participate in certain activities. However, they do not assess the *quality* of the student's engagement. In other words, we may learn more about the type and frequency of student participation, but we do not have a sense of value added or learning outcomes associated with campus involvement. Further, by suggesting that student involvement may be compromised as a result of constant technological distractions, does this mean the level of physical or mental effort placed into an involvement activity is also compromised? Is the level of effort toward involvement reduced because of distractions, and if so, does this mean that resulting opportunities for student development are reduced as well?

The socially interactive technology media studied in this dissertation will soon, if not already, be dated. For example, Instant Message as a stand-alone media appears to be the least desirable form of social technology. In this study, use of other technology such as cell phones, texting, social networking, and email were far more popular. As new media develop, older ones (although still relatively new by most standards) become antiquated. Another example of this would be a stand-alone cellular phone used for placing phone calls with limited text message functioning versus the multi-functioning Smartphones that are popular today (i.e. iPhones). With the constant refinement and

development of these media, students in the future will surely employ technology that is currently being developed and marketed to college students. Put simply, while the responses from participants in this study were collected in late Spring of 2010, this study may already be dated because students are using a later version of similar devices or new media of social technology. Staying abreast of the devices that students use in their daily lives may prove challenging. Thus, research including the SITs noted in this study as well as those currently under development may capture the frequency of use and the type of new devices commonly found in our student communities.

Finally, several questions can be posed regarding the future of student development studies and literature. If there is a new notion of student involvement, or at least that involvement can be increased or enhanced via technology, what does this mean for our traditional constructs of these terms? Given the traditional notions of engagement and involvement which include a physical space component (where a student must be located spatially around others in the campus community or within close proximity), it is worth considering how these constructs will evolve. Moreover, are the developmental theories on student involvement and engagement now dated because of the reality of today's college student? For example, Astin's (1993) theory of involvement may be revisited to include the use of technology in as it continues to play a larger role in the lives of our students. While these questions will take significant time, study, and research, and are beyond the scope of this study, they do pose a question about the future of the way we interpret theoretical perspectives as the reality of today's college student continues to evolve.

Conclusion

Students on college campuses today can be present in multiple environments, regardless of their physical location, with the mere click of a mouse or touch of a screen. For better or for worse, despite the opinions of those of other generations who might not use or embrace social technology in similar ways as the students of this generation, this reality is here to stay (Haythronthwaite & Wellman, 2002; Jones, 2002). Participants in this study report using technology via multiple media, for numerous hours per day. In addition, the use of technology has been woven into day-to-day communication with family and friends, time spent in class or studying, and campus activities and events. The benefits of this practice, as well as noted concerns (i.e Ophir et al., 2009) are yet to be fully realized. Although the notions of student involvement (Astin, 1993) and student engagement (Kuh, 2001) have been established in the canon of student development literature, they were developed prior to the boom in technology embraced by this generation of students (Haythronthwaite & Wellman, 2002; Junco & Mastrodicasa, 2007). While current literature is addressing this shift in the lives of students toward more tech-centered campus communities, future research and attention to this topic will provide researchers, academics, and professionals with the information needed to better understand our students, and the perspectives and needs unique to this generation.

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Appendix A

National Survey of Student Engagement 2008

The College Student Report

1 **In your experience at your institution during the current school year, about how often have you done each of the following? Mark your answers in the boxes. Examples: ☒ or ■**

	Very often	Often	Some-times	Never
a. Asked questions in class or contributed to class discussions	☐	☐	☐	☐
b. Made a class presentation	☐	☐	☐	☐
c. Prepared two or more drafts of a paper or assignment before turning it in	☐	☐	☐	☐
d. Worked on a paper or project that required integrating ideas or information from various sources	☐	☐	☐	☐
e. Included diverse perspectives (different races, religions, genders, political beliefs, etc.) in class discussions or writing assignments	☐	☐	☐	☐
f. Come to class without completing readings or assignments	☐	☐	☐	☐
g. Worked with other students on projects **during class**	☐	☐	☐	☐
h. Worked with classmates **outside of class** to prepare class assignments	☐	☐	☐	☐
i. Put together ideas or concepts from different courses when completing assignments or during class discussions	☐	☐	☐	☐
j. Tutored or taught other students (paid or voluntary)	☐	☐	☐	☐
k. Participated in a community-based project (e.g., service learning) as part of a regular course	☐	☐	☐	☐
l. Used an electronic medium (listserv, chat group, Internet, instant messaging, etc.) to discuss or complete an assignment	☐	☐	☐	☐
m. Used e-mail to communicate with an instructor	☐	☐	☐	☐
n. Discussed grades or assignments with an instructor	☐	☐	☐	☐
o. Talked about career plans with a faculty member or advisor	☐	☐	☐	☐
p. Discussed ideas from your readings or classes with faculty members outside of class	☐	☐	☐	☐
q. Received prompt written or oral feedback from faculty on your academic performance	☐	☐	☐	☐
r. Worked harder than you thought you could to meet an instructor's standards or expectations	☐	☐	☐	☐
s. Worked with faculty members on activities other than coursework (committees, orientation, student life activities, etc.)	☐	☐	☐	☐
t. Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)	☐	☐	☐	☐
u. Had serious conversations with students of a different race or ethnicity than your own	☐	☐	☐	☐
v. Had serious conversations with students who are very different from you in terms of their religious beliefs, political opinions, or personal values	☐	☐	☐	☐

2 **During the current school year, how much has your coursework emphasized the following mental activities?**

	Very much	Quite a bit	Some	Very little
a. **Memorizing** facts, ideas, or methods from your courses and readings so you can repeat them in pretty much the same form	☐	☐	☐	☐
b. **Analyzing** the basic elements of an idea, experience, or theory, such as examining a particular case or situation in depth and considering its components	☐	☐	☐	☐
c. **Synthesizing** and organizing ideas, information, or experiences into new, more complex interpretations and relationships	☐	☐	☐	☐
d. **Making judgments** about the value of information, arguments, or methods, such as examining how others gathered and interpreted data and assessing the soundness of their conclusions	☐	☐	☐	☐
e. **Applying** theories or concepts to practical problems or in new situations	☐	☐	☐	☐

3 **During the current *school year*, about how much reading and writing have you done?**

a. Number of assigned textbooks, books, or book-length packs of course readings

☐ None ☐ 1-4 ☐ 5-10 ☐ 11-20 ☐ More than 20

b. Number of books read on your own (not assigned) for personal enjoyment or academic enrichment

☐ None ☐ 1-4 ☐ 5-10 ☐ 11-20 ☐ More than 20

c. Number of written papers or reports of **20 pages or more**

☐ None ☐ 1-4 ☐ 5-10 ☐ 11-20 ☐ More than 20

d. Number of written papers or reports **between 5 and 19 pages**

☐ None ☐ 1-4 ☐ 5-10 ☐ 11-20 ☐ More than 20

e. Number of written papers or reports of **fewer than 5 pages**

☐ None ☐ 1-4 ☐ 5-10 ☐ 11-20 ☐ More than 20

4 **In a *typical week*, how many homework problem sets do you complete?**

	None	1-2	3-4	5-6	More than 6
a. Number of problem sets that take you **more** than an hour to complete	☐	☐	☐	☐	☐
b. Number of problem sets that take you **less** than an hour to complete	☐	☐	☐	☐	☐

5 **Mark the box that best represents the extent to which your examinations during the current school year have challenged you to do your best work.**

Very little ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 Very much

6 **During the current school year, about how often have you done each of the following?**

	Very often	Often	Some-times	Never
a. Attended an art exhibit, play, dance, music, theater, or other performance	☐	☐	☐	☐
b. Exercised or participated in physical fitness activities	☐	☐	☐	☐
c. Participated in activities to enhance your spirituality (worship, meditation, prayer, etc.)	☐	☐	☐	☐
d. Examined the strengths and weaknesses of your own views on a topic or issue	☐	☐	☐	☐
e. Tried to better understand someone else's views by imagining how an issue looks from his or her perspective	☐	☐	☐	☐
f. Learned something that changed the way you understand an issue or concept	☐	☐	☐	☐

7 **Which of the following have you done or do you plan to do before you graduate from your institution?**

	Done	Plan to do	Do not plan to do	Have not decided
a. Practicum, internship, field experience, co-op experience, or clinical assignment	☐	☐	☐	☐
b. Community service or volunteer work	☐	☐	☐	☐
c. Participate in a learning community or some other formal program where groups of students take two or more classes together	☐	☐	☐	☐
d. Work on a research project with a faculty member outside of course or program requirements	☐	☐	☐	☐
e. Foreign language coursework	☐	☐	☐	☐
f. Study abroad	☐	☐	☐	☐
g. Independent study or self-designed major	☐	☐	☐	☐
h. Culminating senior experience (capstone course, senior project or thesis, comprehensive exam, etc.)	☐	☐	☐	☐

8 **Mark the box that best represents the quality of your relationships with people at your institution.**

a. Relationships with **other students**

Unfriendly, Unsupportive, Sense of alienation ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 Friendly, Supportive, Sense of belonging

b. Relationships with **faculty members**

Unavailable, Unhelpful, Unsympathetic ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 Available, Helpful, Sympathetic

c. Relationships with **administrative personnel and offices**

Unhelpful, Inconsiderate, Rigid ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 Helpful, Considerate, Flexible

9 About how many hours do you spend in a typical 7-day week doing each of the following?

a. Preparing for class (studying, reading, writing, doing homework or lab work, analyzing data, rehearsing, and other academic activities)

☐ 0 ☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-25 ☐ 26-30 ☐ More than 30
Hours per week

b. Working for pay **on campus**

☐ 0 ☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-25 ☐ 26-30 ☐ More than 30
Hours per week

c. Working for pay **off campus**

☐ 0 ☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-25 ☐ 26-30 ☐ More than 30
Hours per week

d. Participating in co-curricular activities (organizations, campus publications, student government, fraternity or sorority, intercollegiate or intramural sports, etc.)

☐ 0 ☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-25 ☐ 26-30 ☐ More than 30
Hours per week

e. Relaxing and socializing (watching TV, partying, etc.)

☐ 0 ☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-25 ☐ 26-30 ☐ More than 30
Hours per week

f. Providing care for dependents living with you (parents, children, spouse, etc.)

☐ 0 ☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-25 ☐ 26-30 ☐ More than 30
Hours per week

g. Commuting to class (driving, walking, etc.)

☐ 0 ☐ 1-5 ☐ 6-10 ☐ 11-15 ☐ 16-20 ☐ 21-25 ☐ 26-30 ☐ More than 30
Hours per week

10 To what extent does your institution emphasize each of the following?

	Very much	Quite a bit	Some	Very little
a. Spending significant amounts of time studying and on academic work	☐	☐	☐	☐
b. Providing the support you need to help you succeed academically	☐	☐	☐	☐
c. Encouraging contact among students from different economic, social, and racial or ethnic backgrounds	☐	☐	☐	☐
d. Helping you cope with your non-academic responsibilities (work, family, etc.)	☐	☐	☐	☐
e. Providing the support you need to thrive socially	☐	☐	☐	☐
f. Attending campus events and activities (special speakers, cultural performances, athletic events, etc.)	☐	☐	☐	☐
g. Using computers in academic work	☐	☐	☐	☐

11 To what extent has your experience at this institution contributed to your knowledge, skills, and personal development in the following areas?

	Very much	Quite a bit	Some	Very little
a. Acquiring a broad general education	☐	☐	☐	☐
b. Acquiring job or work-related knowledge and skills	☐	☐	☐	☐
c. Writing clearly and effectively	☐	☐	☐	☐
d. Speaking clearly and effectively	☐	☐	☐	☐
e. Thinking critically and analytically	☐	☐	☐	☐
f. Analyzing quantitative problems	☐	☐	☐	☐
g. Using computing and information technology	☐	☐	☐	☐
h. Working effectively with others	☐	☐	☐	☐
i. Voting in local, state, or national elections	☐	☐	☐	☐
j. Learning effectively on your own	☐	☐	☐	☐
k. Understanding yourself	☐	☐	☐	☐
l. Understanding people of other racial and ethnic backgrounds	☐	☐	☐	☐
m. Solving complex real-world problems	☐	☐	☐	☐
n. Developing a personal code of values and ethics	☐	☐	☐	☐
o. Contributing to the welfare of your community	☐	☐	☐	☐
p. Developing a deepened sense of spirituality	☐	☐	☐	☐

12 Overall, how would you evaluate the quality of academic advising you have received at your institution?

☐ Excellent
☐ Good
☐ Fair
☐ Poor

13 How would you evaluate your entire educational experience at this institution?

☐ Excellent
☐ Good
☐ Fair
☐ Poor

14 If you could start over again, would you go to the *same institution* you are now attending?

☐ Definitely yes
☐ Probably yes
☐ Probably no
☐ Definitely no

15 **Write in your year of birth:** 1 9 _ _

16 **Your sex:**

☐ Male ☐ Female

17 **Are you an international student or foreign national?**

☐ Yes ☐ No

18 **What is your racial or ethnic identification? (Mark only one.)**

☐ American Indian or other Native American
☐ Asian, Asian American, or Pacific Islander
☐ Black or African American
☐ White (non-Hispanic)
☐ Mexican or Mexican American
☐ Puerto Rican
☐ Other Hispanic or Latino
☐ Multiracial
☐ Other
☐ I prefer not to respond

19 **What is your current classification in college?**

☐ Freshman/first-year ☐ Senior
☐ Sophomore ☐ Unclassified
☐ Junior

20 **Did you begin college at your current institution or elsewhere?**

☐ Started here ☐ Started elsewhere

21 **Since graduating from high school, which of the following types of schools have you attended other than the one you are attending now? (Mark all that apply.)**

☐ Vocational or technical school
☐ Community or junior college
☐ 4-year college other than this one
☐ None
☐ Other

22 **Thinking about this current academic term, how would you characterize your enrollment?**

☐ Full-time ☐ Less than full-time

23 **Are you a member of a social fraternity or sorority?**

☐ Yes ☐ No

24 **Are you a student-athlete on a team sponsored by your institution's athletics department?**

☐ Yes ☐ No (Go to question 25.)

On what team(s) are you an athlete (e.g., football, swimming)? Please answer below:

25 **What have most of your grades been up to now at this institution?**

☐ A ☐ B+ ☐ C+
☐ A- ☐ B ☐ C
☐ B- ☐ C- or lower

26 **Which of the following best describes where you are living now while attending college?**

☐ Dormitory or other campus housing (not fraternity/sorority house)
☐ Residence (house, apartment, etc.) within **walking distance** of the institution
☐ Residence (house, apartment, etc.) within **driving distance** of the institution
☐ Fraternity or sorority house

27 **What is the highest level of education that your parent(s) completed? (Mark one box per column.)**

Father	Mother	
☐	☐	Did not finish high school
☐	☐	Graduated from high school
☐	☐	Attended college but did not complete degree
☐	☐	Completed an associate's degree (A.A., A.S., etc.)
☐	☐	Completed a bachelor's degree (B.A., B.S., etc.)
☐	☐	Completed a master's degree (M.A., M.S., etc.)
☐	☐	Completed a doctoral degree (Ph.D., J.D., M.D., etc.)

28 **Please print your major(s) or your expected major(s).**

a. Primary major (Print only one.):

b. If applicable, second major (not minor, concentration, etc.):

THANKS FOR SHARING YOUR RESPONSES!

After completing the survey, please put it in the enclosed postage-paid envelope and deposit it in any U.S. Postal Service mailbox. Questions or comments? Contact the National Survey of Student Engagement, Indiana University, 1900 East Tenth Street, Eigenmann Hall Suite 419, Bloomington IN 47406-7512 or nsse@indiana.edu or www.nsse.iub.edu.

Appendix B

1. Technology and Engagement Survey

Statement of Informed Consent

Dear Boston College Student:

You are being asked to take part in a study that seeks to better understand how students at Boston College use technology in their daily lives to communicate with one another, and how this impacts your college experience. Your selection for participation was by a random sample. Technology included in this study are cell phones, text messaging, Instant Messaging, Facebook and other similar sites, and e-mail. The survey should take less than 10 minutes to complete.

Participation in this study is completely voluntary, and you may decline to participate at any time, without consequence. The questions do not seek to obtain personal or confidential information, and thus your risk of participation is minimal. The study may include risks that are unknown at this time. Responses will be kept anonymous and confidential, and will in no way be linked back to you.

Participation in this study has several benefits. It will assist faculty and staff members in better understanding how students use technology in their daily lives. It may also provide further areas of research on college students and how faculty and staff can improve the college experience. The results of this research may be presented at meetings or in published articles. In addition, it may offer you an opportunity to reflect on your use of technology, and how it impacts your time as a student. Finally, you will have the opportunity to participate in a raffle for iTunes gift cards upon completion of the survey. To be eligible, you must complete the survey.

To participate, please click on the 'NEXT' button below. Clicking on this link and proceeding with the survey indicate that you have read and accept the terms and conditions stated above.

If you have any questions, you can contact the primary researcher at brent.ericson.1@bc.edu. If you have any questions regarding your rights as a research subject, please call the Boston College Office for Research Protections at 617 -552-4778. Your time and participation is appreciated.

2. Involvement in your college experience

The following questions are designed to gauge your level of involvement in out -of-the-classroom activities at your University.

3. Involvement in your out of the classroom activities

1. To what extent has your experience at this institution contributed to your knowledge, skills, and personal development in the following areas?

	Very Much	Quite a bit	Some	Very Little
Contributing to the welfare of your community	○	○	○	○
Developing a personal code of values and ethics	○	○	○	○
Solving complex real-world problems	○	○	○	○
Understanding people of other racial and ethnic backgrounds	○	○	○	○
Understanding yourself	○	○	○	○
Learning effectively on your own	○	○	○	○
Voting in local, state, or national elections	○	○	○	○

2. In your experience at your institution during the last school year, about how often have you done each of the following:

	Very Often	Often	Sometimes	Never
Had serious conversations with students who are very different from you in terms of their religious beliefs, policital opinions, or personal values?	○	○	○	○
Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)?	○	○	○	○
Had serious conversations with students of a different race or ethnicity than your own?	○	○	○	○

3. During the last school year, about how often have you done each of the following?

	Very Often	Often	Sometimes	Never
Attended an art exhibit, play, dance, music, theater, or other preformance	○	○	○	○
Exercised or participated in physical fitness activities	○	○	○	○
Participated in activities to enhance your spirituality (worship, meditation, prayer, etc.)	○	○	○	○
Examined the strengths and weaknesses of your own views on a topic or issue	○	○	○	○
Tried to better understand someone else's views by imagining how an issue looks from his or her perspective	○	○	○	○
Learned something that changed the way you understand an issue or concept	○	○	○	○

4. About how many hours do you spend in a typical 7-day week doing each of the following:

	0	1-5	6-10	11-15	16-20	21-25	26-30	More than 30
Preparing for class (studying, reading, writing, doing homework or lab work, analyzing data, rehearsing, and other academic activities)	○	○	○	○	○	○	○	○
Working for pay ON CAMPUS	○	○	○	○	○	○	○	○
Working for pay OFF CAMPUS	○	○	○	○	○	○	○	○
Participating in co-curricular activities (organizations, campus publications, student government, intercollegiate or intramural sports, etc.)	○	○	○	○	○	○	○	○
Relaxing and socializing (i.e. watching TV, partying, etc.)	○	○	○	○	○	○	○	○
Providing care for dependents living with you (parents, children, spouse, etc.)	○	○	○	○	○	○	○	○
Commuting to class (driving, walking, etc.)	○	○	○	○	○	○	○	○

4. Use of Technology Section

This section is intended to measure how often you use technology to socialize with others. Again, this information will not be linked to your name in any publication, and is ONLY for the educational benefit of the researcher.

5. On average, how many hours per day do you talk on your cellular phone?

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 10+

6. On average, how many hours per day do you spend sending and/or receiving text messages?

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 10+

7. On average, how many hours per day do you spend reading or sending electronic mail (e-mail)?

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 10+

8. On average, how many hours per day do you spend chatting on an instant message (IM) program?

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 10+

9. On average, how many hours per day do you spend on a Social Network Site, such as Facebook or MySpace?

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 10+

5. Open Ended Question

10. In what way(s) do you feel the technology devices mentioned in this study either help or hinder your experience as a college student?

6. Demographics

This section is intended to learn a little more about you as a student. This information will NOT be linked to you in ANY way.

11. I am a:

- ○ Male
- ○ Female

12. I am a student in:

- ☐ School of Management
- ☐ Arts and Sciences
- ☐ School of Education
- ☐ School of Nursing

13. I live

- ☐ in a Boston College residence hall
- ☐ off campus

14. I identify myself as

- ☐ an AHANA student
- ☐ a White, non-AHANA student

7. Thank you and raffle entry.

Thank you for your participation in this survey. Your responses will benefit both the researcher as well as provide information for future studies on this topic.

In addition the researcher would like to acknowledge the National Survey of Student Engagement. The four items in section 3 of this survey were used with permission from The College Student Report, National Survey of Student Engagement, Copyright 2001-10 The Trustees of Indiana University.

15. If you would like to enter into a raffle for a 25 dollar iTunes gift card, please include your e-mail address. Your name will not be associated with your responses.